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TEXTILE WORLD RECORD

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LORD & NAGLE COMPANY · Boston & Philadelphia

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

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ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

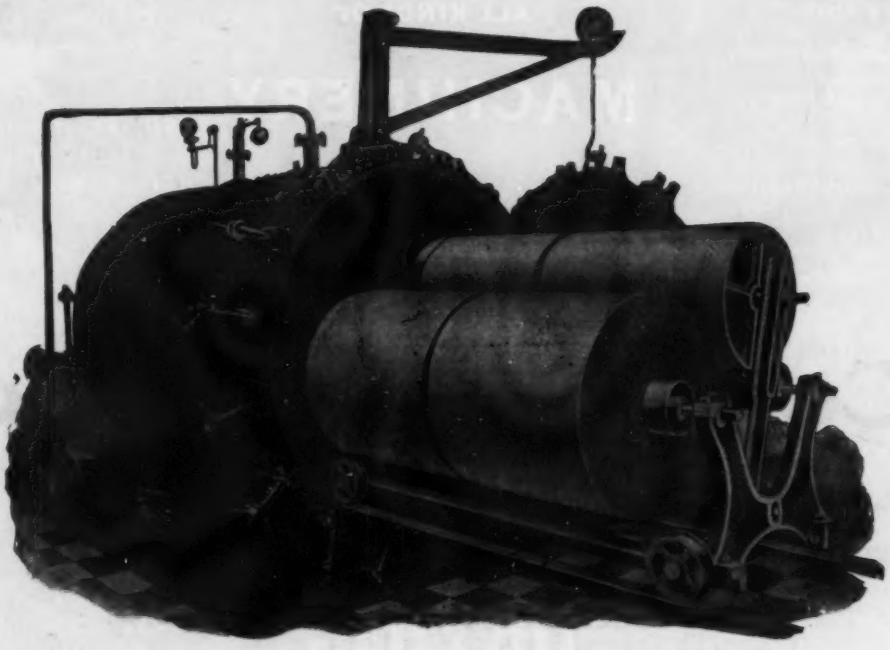
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

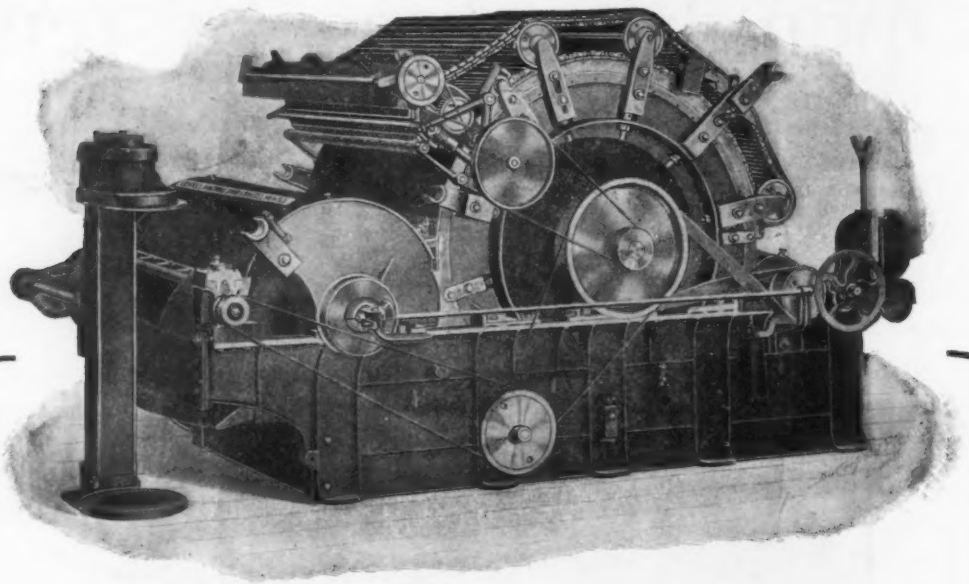
Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

PHILADELPHIA

Sole Makers for the United States



Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

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Plans, Specifications and Estimates furnished upon application.

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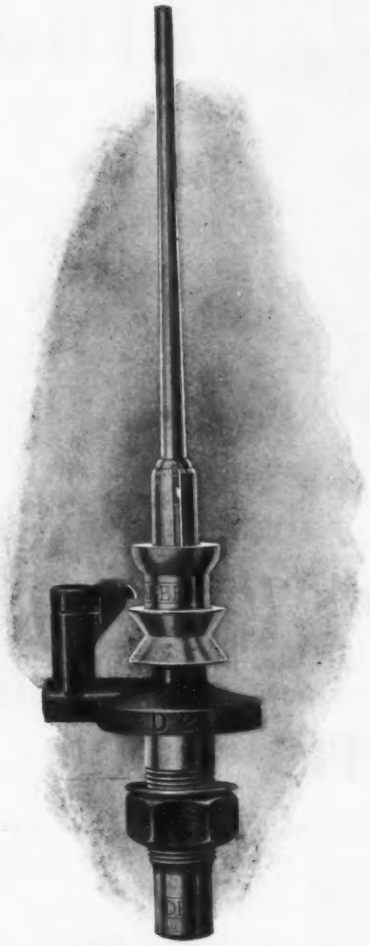
A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

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We Also Build Looms.

THE GEO. W. STAFFORD COMPANY

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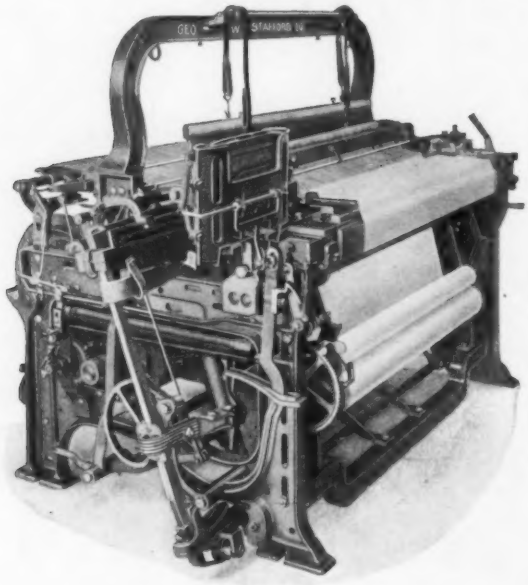

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History Repeats Itself

Our previous successful efforts in the line of improvements in weaving machinery have culminated in our new

IDEAL AUTOMATIC LOOM

Considering quantity of goods produced per weaver, quality of goods, cost of supplies, repair bills, etc., there is no other loom can compare with it for economy of operation.

Cop or bobbin filling may be used equally well. One weaver can operate successfully from twelve to thirty looms, and under favorable conditions even more. No reduction in speed. A high grade plain loom as a basis.

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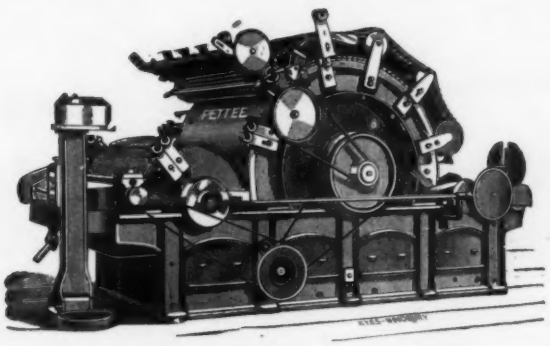

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REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

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INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

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WHITIN MACHINE WORKS,

Cotton Machinery

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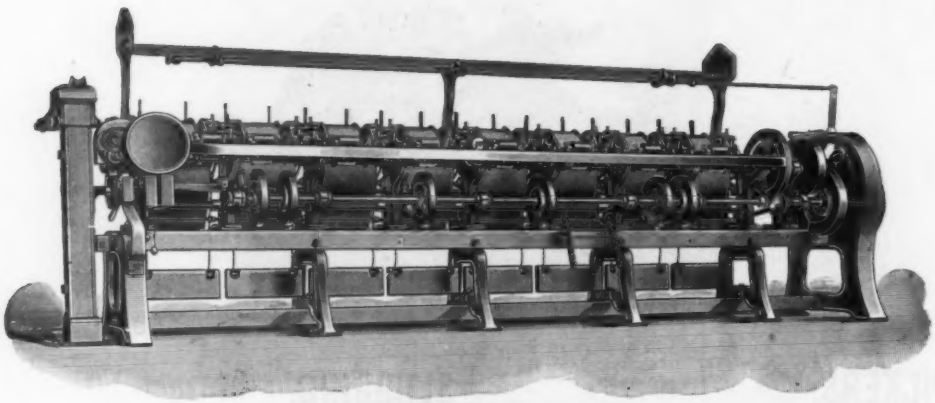

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Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
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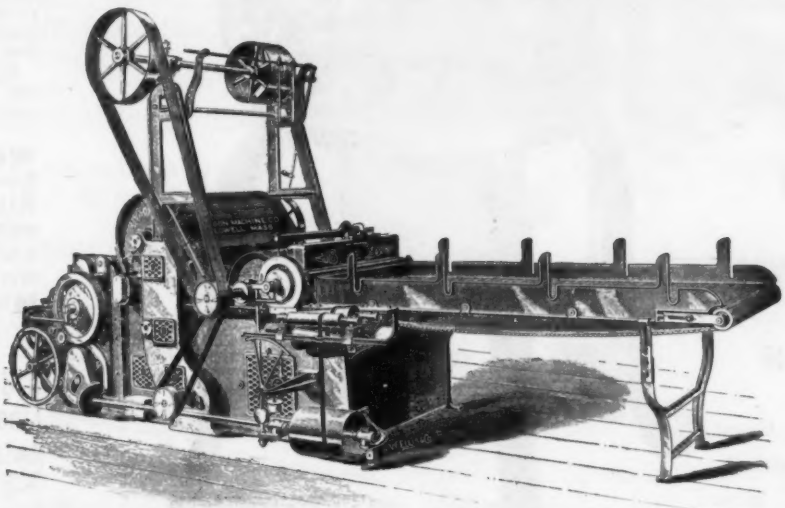
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

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LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

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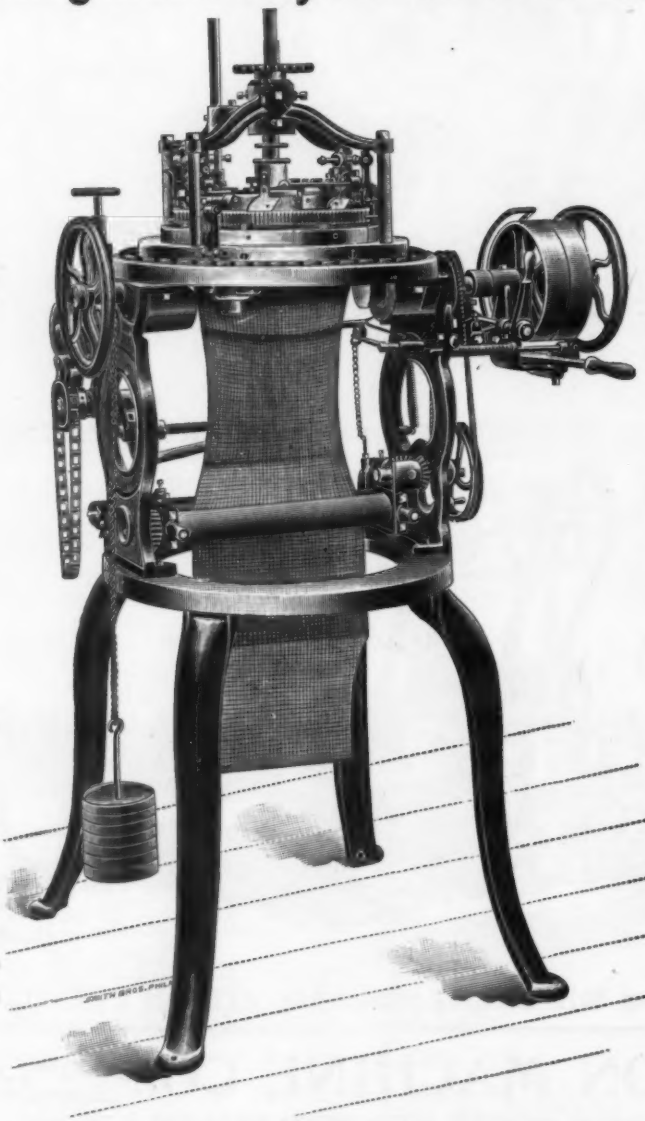
Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes. 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

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A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

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July, 1905, with a business growth to such an extent that more room is absolutely necessary.

At your service if you will

Call or write and I will

Oblige you with information of details and practical results on

Bobbin and cop winding and other machinery that is manufactured here and

Kept in touch with the requirements

Always producing the work that is correct,

Letting nothing go out

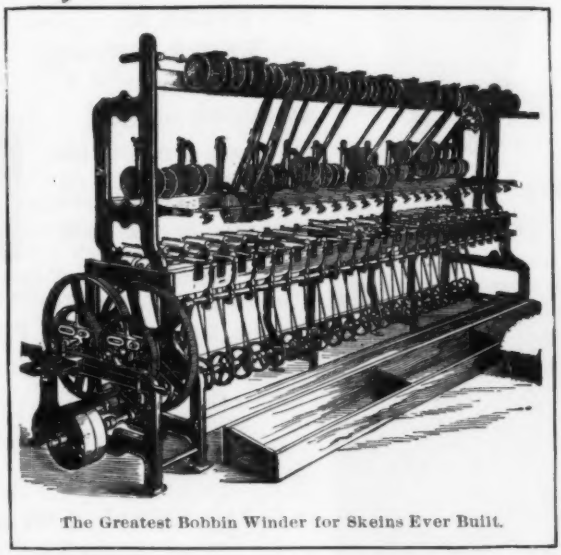
That is not satisfactory before delivery.

Every means are used to

Manufacture winders, spoolers, warpers, beamers and other textile machinery

Up to the standard of reputation

Secured by hard and earnest efforts and guaranted to give results satisfactory in every particular.



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Textile Machinery

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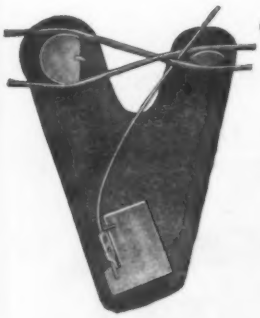
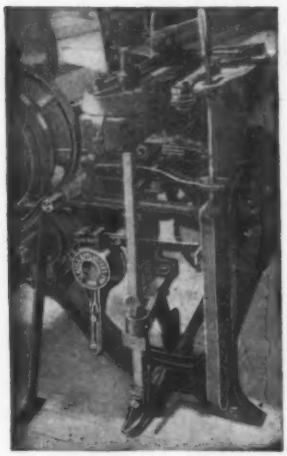
Absolute Efficiency from Bed-Rock Simplicity



Our **WARP-STOP** controls **TWO threads by ONE spring WIRE, held in a COMB,** engaging the warp in such a way that **the TENSION is UNDER CONTROL,** and **ABRASION of the yarn is AVOIDED.**

The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving **a CLEAR SIGNAL of the place of the BROKEN END,** and, by striking **a CONTACT SLIP upon which LINT CANNOT COLLECT,** closes the circuit through **a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED,** and **actuated by a SPARKLESS current.**

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Platt's Patent Opening and Picking Machinery.
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Flax, Hemp and Jute Machinery.

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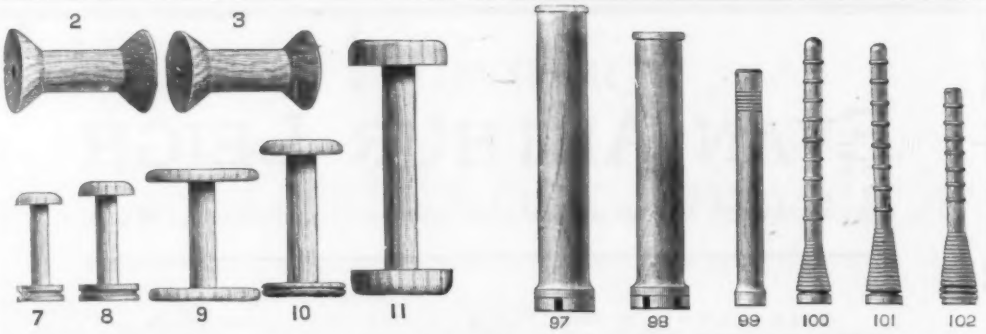
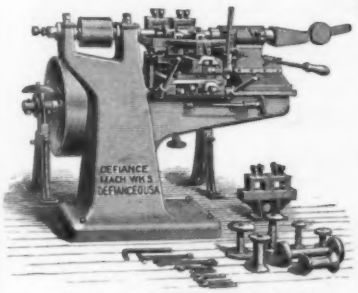
The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.



SPOOL AND BOBBIN MACHINERY



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Complete Equipment
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MOST MODERN TOOLS
25% SAVED
Over the Old Methods
Send for Catalogue and Particulars to
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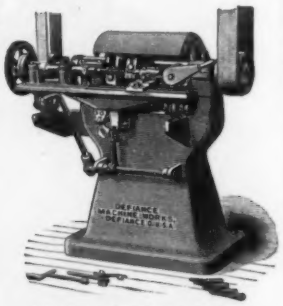
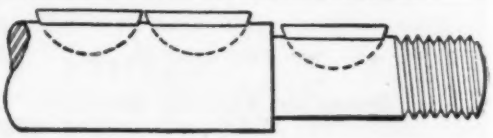
DEFIANCE, OHIO



AUTOMATIC BOBBIN LATHE

Key Seating Attachment
FOR
Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

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Reg. U. S. Pat. Of.

There is only **ONE**

ALBANY GREASE

AND WE ARE THE ONLY MAKERS.

We have solved the problem of economical lubrication.

Cost of using oil

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OUR SPECIAL OFFER, a Sample Can of Albany Grease with an Albany Grease Cup free of charge or expense for testing. The only information necessary to send is pipe connection in bearing, DEPTH OF OIL HOLE FROM TOP OF TAP TO JOURNAL, and give particular part of machinery on which the same is to be used.

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For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.

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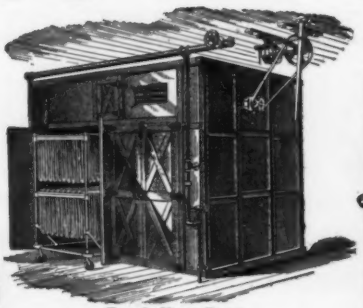
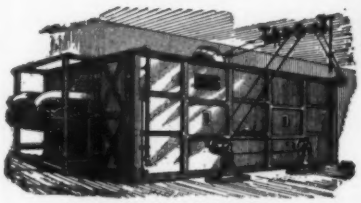


Truck Yarn Dryer.



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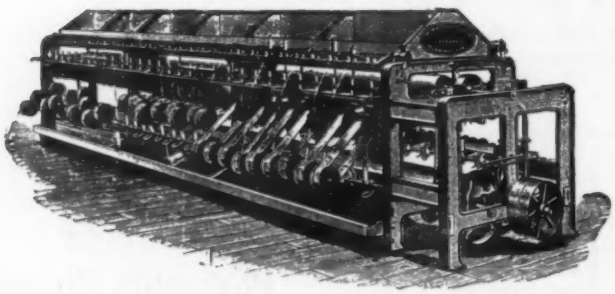

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Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

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Second-hand Tentering Machines in good repair at low prices.

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Builders of Modern BRAMWELL AND APPERLY FEEDS, and the

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LAWSON BRANCH,

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Special Machinery for the Manufacture of Twines,

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GOOD'S COMBINED HACKLING AND SPREADING MACHINE,
LONG REACH SCREW-GILL DRAWING FRAMES,
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PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,
AND OTHER
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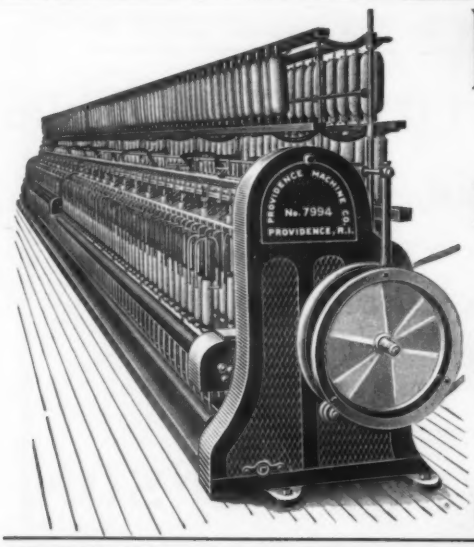
IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS
BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.



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Eliminate Guess Work

Because they have been designed for the work by engineers who have made a careful study of textile conditions. Because they are adapted to the work, they do it better and more economically.

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Under the Breese Patents

For Wool Spinning

and other Fibrous Materials.

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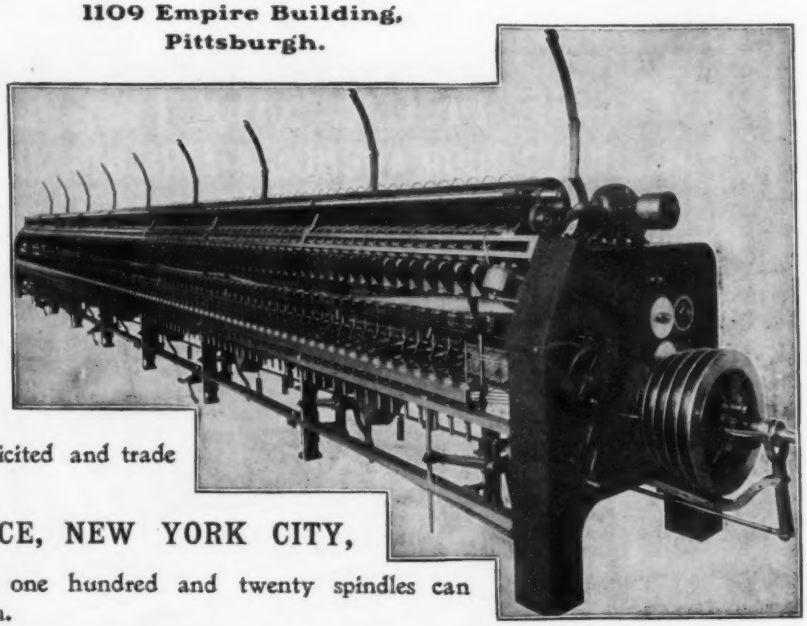

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Where a frame of one hundred and twenty spindles can be seen in operation.

Cool and Healthy Operatives

turn out more and better work and thus earn more money for employers

This is one more reason why so many of our leading mills are installing

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We are experts in Ventilation, Heating, Cooling and Drying. Our long practical experience and Barney Fans form a combination that produces the right results.

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"STEEL MIXTURE"
BOILER DOOR ARCHES AND FIRE BOX BLOCKS
TONGUED & GROOVED
PATENT BACK COMBUSTION CHAMBER ARCH
ARCHES MADE FOR ONE OR MORE DOOR OPENINGS
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MANUF'D BY
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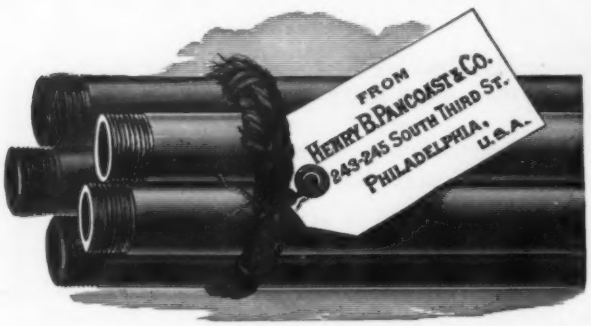
INQUIRIES SOLICITED
TROY, N.Y. U.S.A.



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for steam, water and gas.

BRASS, COPPER AND LEAD PIPE.

Iron and Brass Fittings, Valves, Etc.
Iron and Brass Railing and
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Steam and Hot Water Heating Apparatus.

Steam Specialties, Pipe Fitters' Tools, Etc.

PIPE CUTTING A SPECIALTY.

SKEIN AND SLUBBING MACHINES

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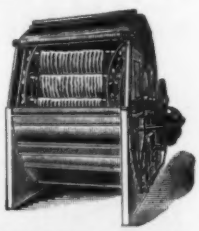
75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

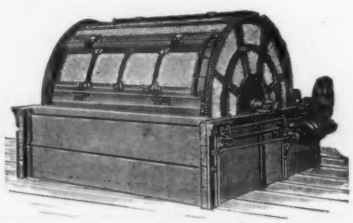
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

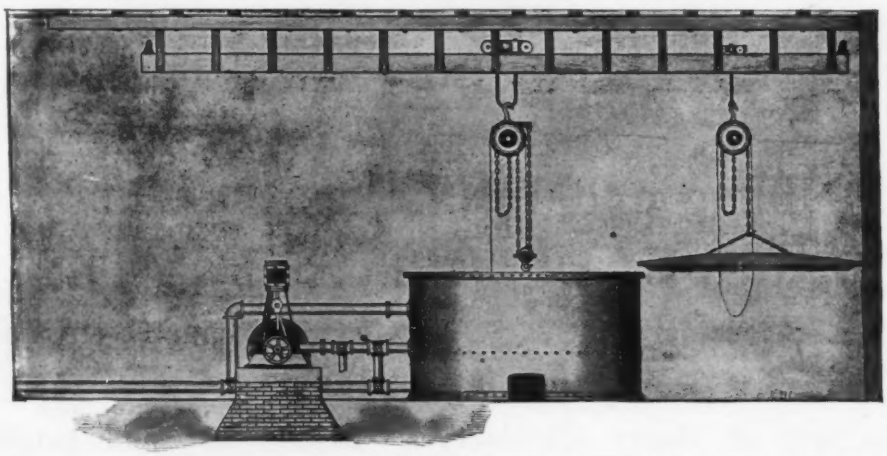
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

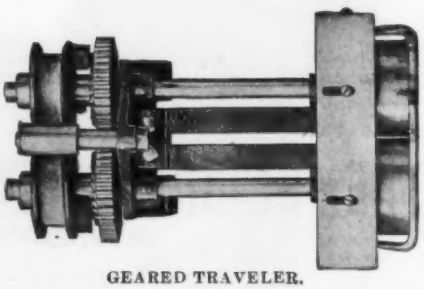
"20th CENTURY" MACHINERY

TRUCK YARN DRYER

Dryers for Wool and Cotton Stock, Yarn, Stockings and Underwear.

Carbonizers, Yarn and Wool Scouring Machines.

Ventilating Fans, Bleachers.



GEARED TRAVELER.

We also manufacture Kershaw's Geared Traveler and Improved Web Feed.

DYEING MACHINES, TOM TOMS, CHROMING, WASHING AND OXIDIZING MACHINES.

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Rubber Machinery, Including Calenders, Washers, Mixers, etc.

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Builders of Heavy Machinery. High Grade and Large Castings a Specialty.

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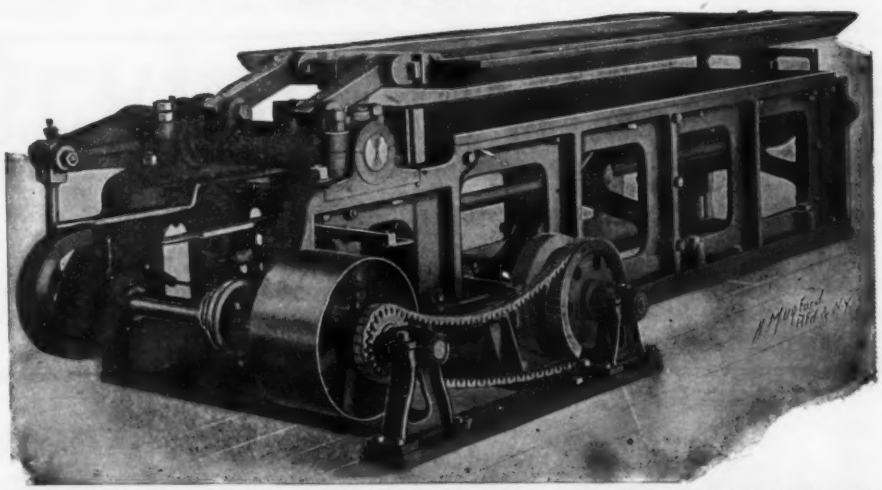

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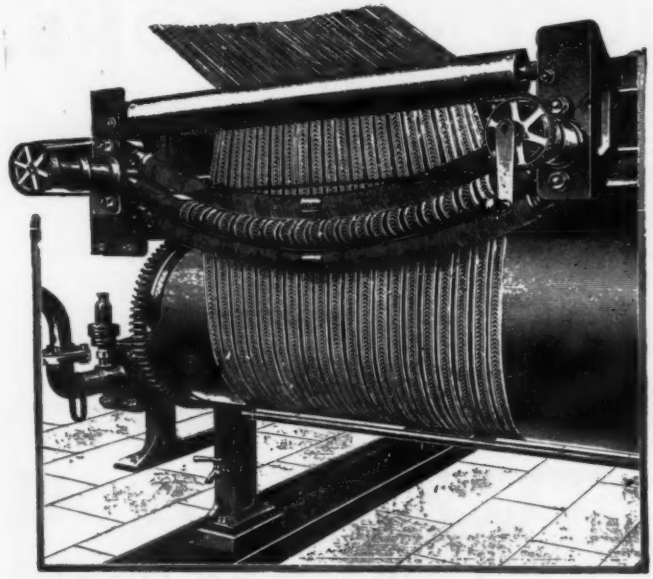
Chilled and Soft Iron Rolls, Machine Moulded and Machine Cut Gearing, to 20 ft. diameter. Heavy Transmission Machinery, Etc., Etc.
Heavy Castings, in Gray Iron or Semi Steel.

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

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Sole Agents for the United States and Canada.

P. & C. GARNETT, Ltd.

Telegrams "Garnett" Cleckheaton — Wharfe Works, Cleckheaton (Yorks), England

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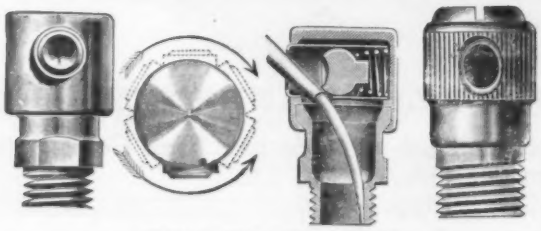
The "Garnett" Machine or Waste Opener

Also The GARNETT Patent Knot-Breaker or Preparer.

For preparing waste for the Garnett Waste Openers, breaking knots and other hard substances, old ropes, bagging, etc. No waste puller should be without this most valuable machine which saves the fine clothing of the Garnett Machine.

Original makers of Garnett or saw-tooth wire, in best Swedish Iron, and Cast Steel, with points hardened by electricity. .... Burr Rollers, Breasts for Woolen Cards, Lickerin Rollers, Rag Machines.



Do You Know

that a machine with no protection from dust and grit in the oil holes leading to a bearing is headed for the scrap heap?

DELAY THE DEMISE

USE

TUCKER DUST PROOF OIL CUPS

POSTAL WILL BRING SAMPLE.

W. & C. F. TUCKER, HARTFORD, CONN.

C. G. SARGENT'S SONS,

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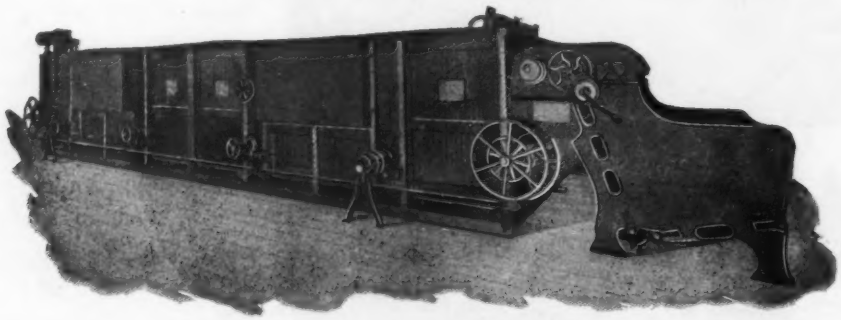

... BUILDERS OF ...

Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
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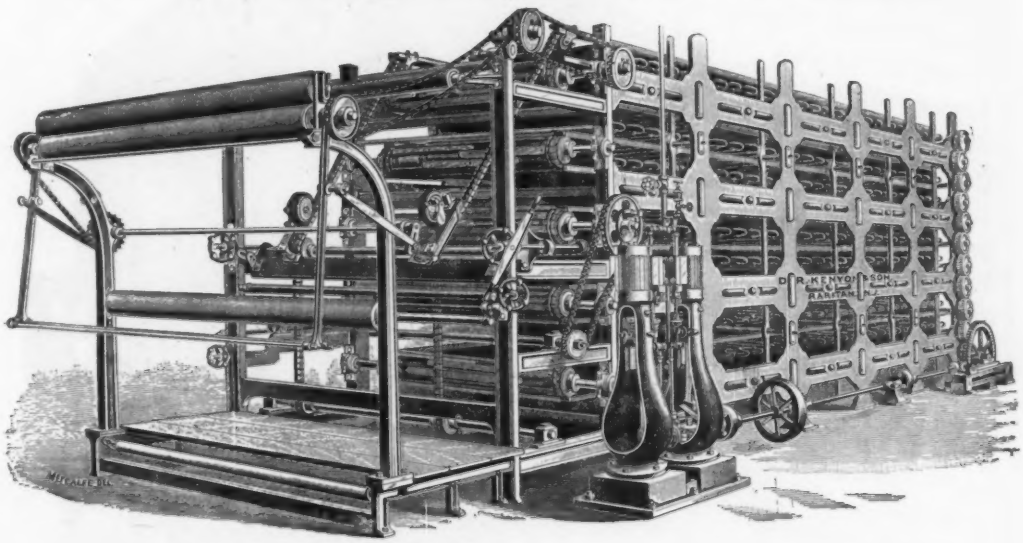
Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs, (double or single,) Dewing Machines, etc.

MANUFACTURED BY

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RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
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Rotary Cloth Washers.
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Dye Tubs and Rinsers.
Wool Washers.
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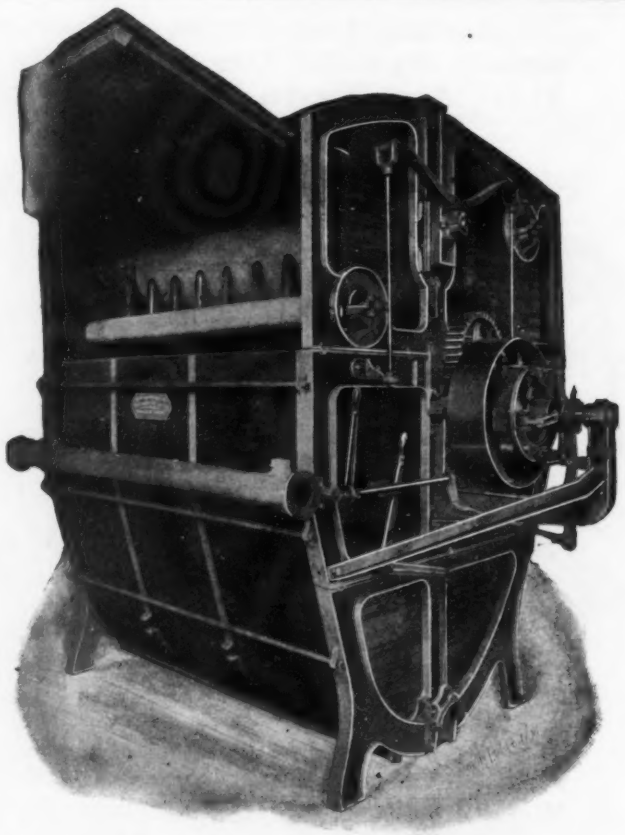
New Rotary Cloth Washer



Type C. For All Fabrics.

Improved Attachments for Fulling and Washing Knit Goods in the roll. Is fully described in Circular No. 10.

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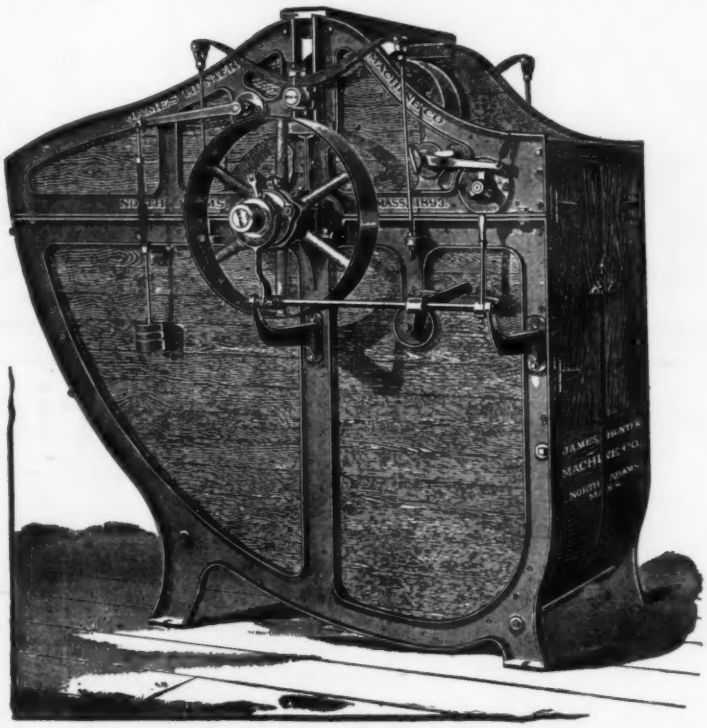
Automatic Wool Washers

PARALLEL RAKE

The "STONE DRYER," for Wool, Cotton, Rags, Etc.

CARBONIZING MACHINERY, ETC.



Fulling Mills, Cloth Washers,

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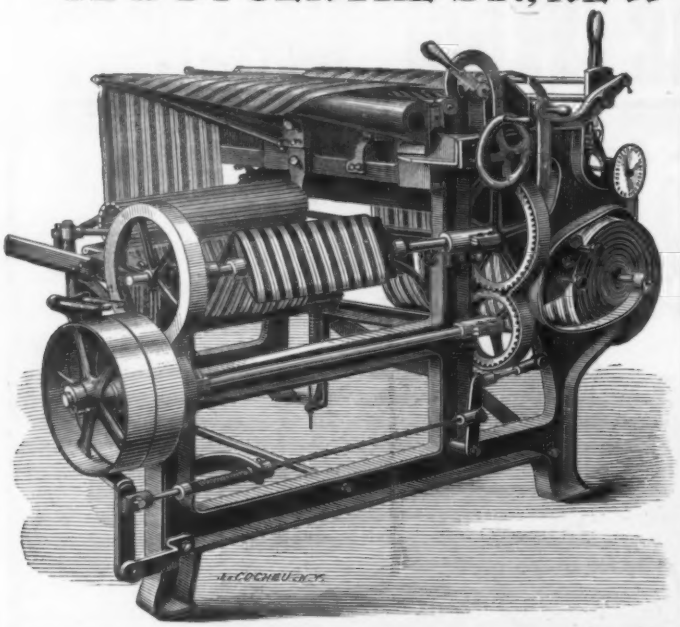

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On Cottons, Woolens and Carpets.

Machines to Measure

and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

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WROUGHT STEEL

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Is a parting PULLEY and can be applied without stripping the shaft.
It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly — keys and set-screws superfluous.
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Particularly adapted to TEXTILE manufacturing.

Sold by the Leading Supply Houses all over the WORLD.

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GREEN'S ECONOMIZER

WE BUILD AND INSTALL MECHANICAL DRAFT PLANTS

Keeps a great volume of water always in reserve at the evaporative point ready for immediate delivery to the boilers or other emergencies.

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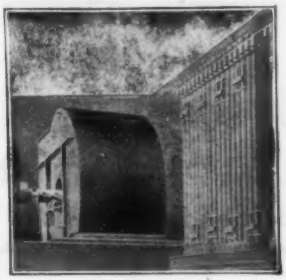

INCREASES Boiler Capacity 20 to 40%

FANS BLOWERS EXHAUSTERS PRESSURE BLOWERS ETC.

SAVES 10 to 20% in Fuel

Designed for high or low pressure.
Natural or mechanical draft.
For other advantages, see our catalog.

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DO YOUR **BELT LACING** RIGHT—

GET A **JACKSON**

BELT-LACER

as the best equipped Textile Mills, Cotton Mills and Woolen Mills are doing—it pays to be able to lace a 5" belt in less than 3 minutes at a cost of one cent—larger belts in proportion.— The Jackson Belt Lacer will do it—and do it in such a way that the belt can be connected or disconnected, shortened or lengthened in a few seconds. Catalog.

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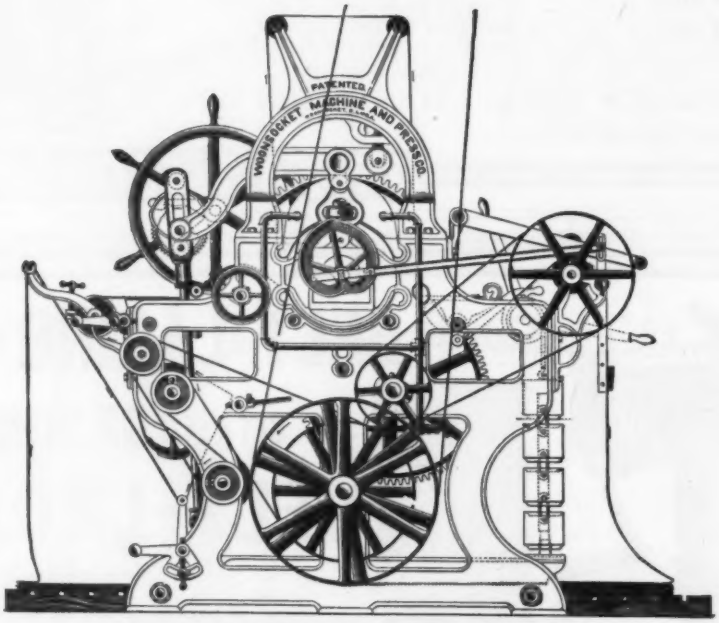
Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



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Woonsocket Machine and Press Company

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DINSMORE

Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

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Successors to Silver & Gay Co., Est. 1832.
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NEVER SLIP COP SPINDLE

PREVENTS BROKEN COPS, SMASHES, WASTE, IMPERFECT GOODS AND ALL THE SHUTTLE TROUBLES WITH COP FILLING . . .

The illustrations explain this simple device:—

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When the spindle is lowered into the shuttle the two parts forming the base are expanded holding the cop firmly in place. The pressure is sufficient to hold the cop on a smooth spindle but the corrugations at the base of the spindle hold the cop still more securely.

The spindle contracts when again raised and the empty cop is easily removed.

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Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

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If your FLYERS are WORN or in bad repair we can sell you these flyers for less than it will cost you to repair your old flyers.

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STEEL ROLL WORK, FLYERS, PRESSERS AND BRASS COMBER ROLLS.

Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

Also Manufacturers of

HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

James Hill Manufacturing Co.,

PROVIDENCE, R. I.

EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

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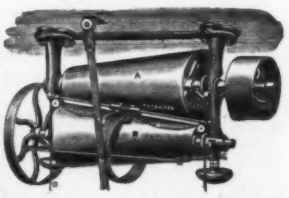

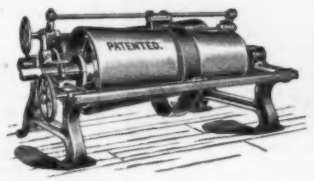

Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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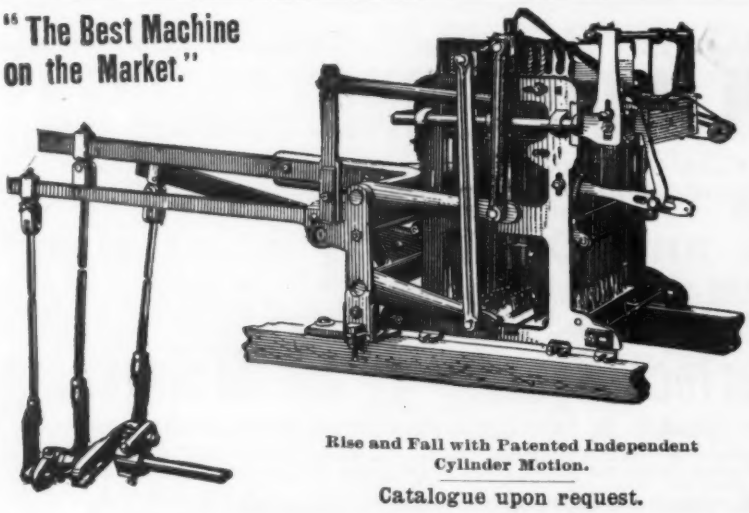

Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

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HALTON JACQUARD

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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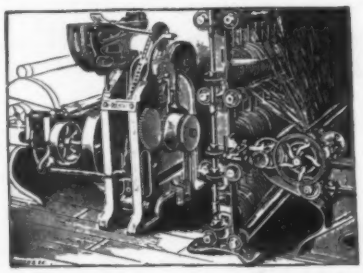

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TORRANCE PATENT AUTOMATIC BALLING MACHINE

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

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NEW ENGLAND DEPARTMENT

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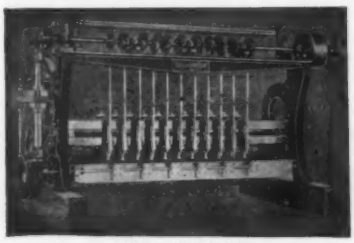

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L. F. FALES

MANUFACTURER AND BUILDER OF

SEWING Manhattan MACHINES

FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

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The Metallic Drawing Roll Co.

INDIAN ORCHARD, MASS.

MANUFACTURERS OF

Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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TRAVERSE WHEEL AND LONG ROLL

Particular Attention Paid to Repairing Grinders of All Kinds and Makes

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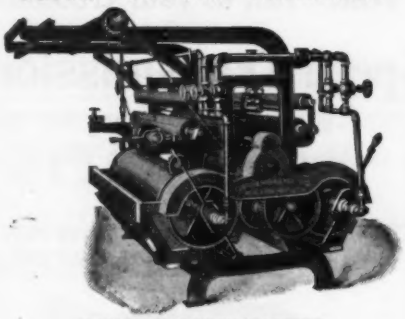

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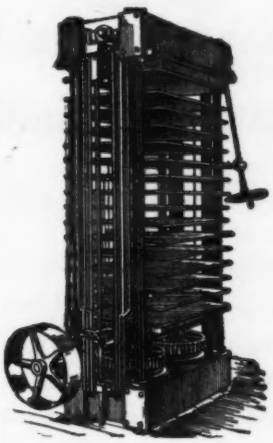

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Successor to THOMAS RAMSDEN,
Maker of

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For Preparing, Finishing Gills and Drawing Boxes

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Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

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MANUFACTURER OF

Hackle, Gill, Card and Comb Pins. Comber Needles all sizes.

Carrying Combs, Porcupines, Tenter Plates, Gills, Fallers and Flat Pins of Every Description. Circle and Faller Repairing and Repinning. Weavers Pick Out Comb Pins.

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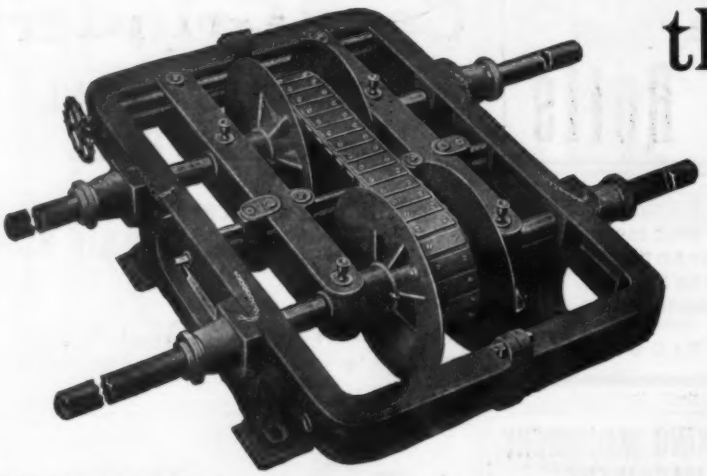

of driving your various machines with individual engines or attempting to regulate their speed with cone pulleys and seen the expense eat up your entire profit, while you were longing and looking for something that would overcome the difficulty?

WE HAVE WHAT YOU ARE LOOKING FOR. Tell us your troubles.

"The Reeves" Variable Speed Transmission

may be connected to any machine, and will give you any speed between the two extremes of variation, instantly and easily, without stopping the machine or shifting a belt; no loss of time.

The cost is insignificant and the expense of operating no more than an ordinary countershaft. Can you afford to be without it? Write for catalog and particulars today.

We also manufacture **"THE REEVES" IRON CENTER WOOD RIM PULLEY.** The hub and spokes are of iron and the rim of wood, combining solidity with belt adhesiveness.

We build this pulley in three designs —split with interchangeable bushing; split bored to fit the shaft; solid bored to fit the shaft.

Catalog and prices furnished on application.

REEVES PULLEY COMPANY,
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Produces and automatically maintains throughout the year the uniformity of conditions that every textile manufacturer desires and now finds it so hard to realize. These conditions he can never get by squirting steam or water into his rooms and trusting to luck.

The whole trend of modern manufacturing is toward trusting more in the machine and less in the man. For this reason all auxiliary apparatus should be as nearly automatic as is possible.

The Bell Humidifier delivers air carrying moisture as aqueous vapor, just as it is found in nature, which moistens thoroughly and uniformly. Being SELF-REGULATING, it does not keep on moistening when further moistening is useless or harmful.

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First-class inducements, such as free sites, bonuses, subscriptions to stock, etc., will be given by a number of cities and towns to secure this class of industry. It is a well-known fact that cotton grown in Indian Territorry and Oklahoma is equal to the very best, owing to its long staple and superior quality. Natural gas in abundance is also available in a number of sections and could be utilized in running cotton and knitting mill machinery.

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Comparative Yarn Tables, showing the equivalent sizes of different systems of Numbering Yarn and Different Standards.

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Of Greatest Durability

THE HIDE from which our raw hide loom pickers are made is always absolutely sound and the best it is possible to obtain. The hide quality of our pickers cannot be improved, and in their construction and workmanship they are as near perfect as it is possible to make them.

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Thread and Silk **SPOOLS** of any description made from one piece, up to 6" long and 3 dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

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Needs no covers,
Will not split or warp;
Not liable to break.

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Built Upright or Horizontal with Low Down Feed

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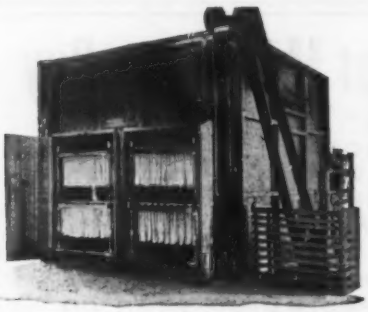

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"THE LATHE THAT RUNS AND RUNS AND RUNS."

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Every conceivable Lathe-job, without discrimination, can be handled on one spindle or t'other, of

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For the big work its a 48-inch Triple-geared—for the small, a 26-inch Back-geared.

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For Cotton, Woolen, Worsted and Silk.

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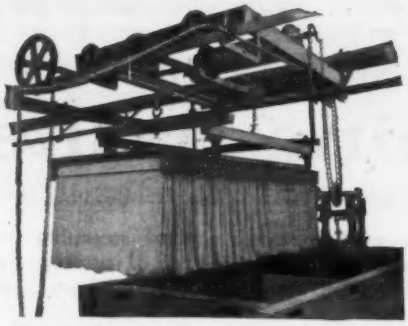
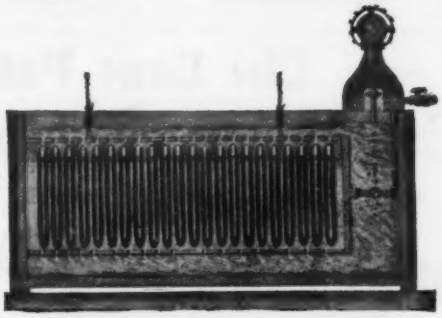
The Hussong Dyeing Machine

Patented Nov. 6, 1900. April 9, 1901. Nov. 29, 1904.

A PERFECT SKEIN DYEING MACHINE



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor. Makes No Waste Whatever. No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

Built by the **American Dyeing Machine Co., Office 609 Pearl St., Camden, N. J.**

BEWARE OF INFRINGEMENTS.

THE COHNEN

CENTRIFUGAL

Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock
OR
Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS

without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING

is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

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American Agents Wanted.

The Lane Patent Steel Frame
Canvas Steaming Basket

MADE WITH OR WITHOUT WOODEN SHOES AS REQUIRED

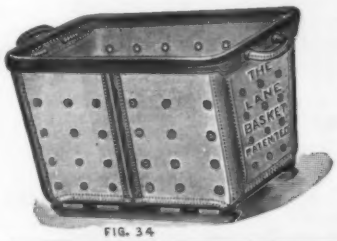

FIG. 34

Adapted to withstand the severe test of steaming better than any other basket, as it is constructed of such materials, and in such a manner as to be unaffected by steam, heat or moisture.

The steadily increasing demand for the Lane Patent Steaming Basket demonstrates the truth of our claims.

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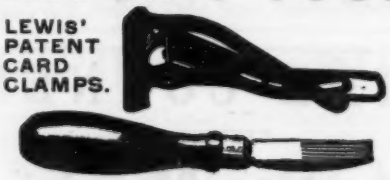
LEWIS' PATENT CARD CLAMPS.



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For Setting Up Bent Teeth of Card Clothing with a variety of all other tools used by Carders and Manufacturers.
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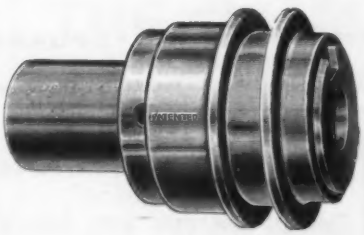

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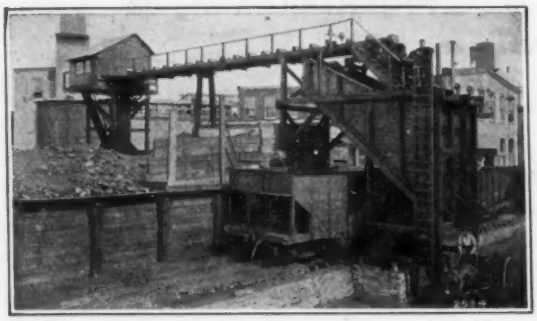
Gravity Discharge Conveyor Handling Coal

Plant of THOMAS POTTER, SONS & CO., Philadelphia.



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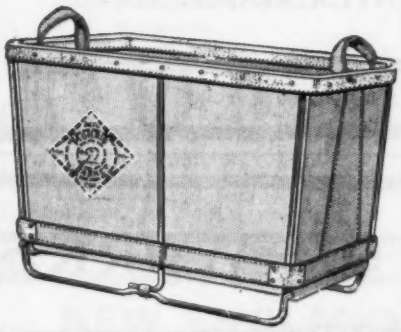

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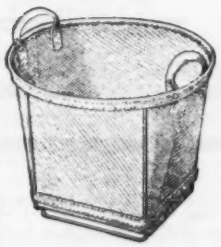
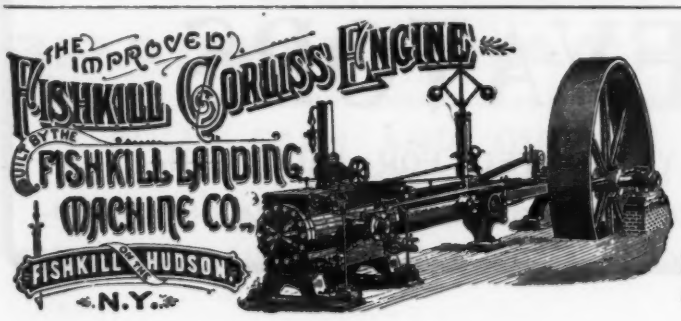


Morris & Co., Groveville, N. J.



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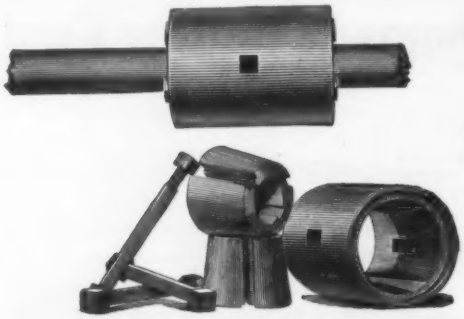

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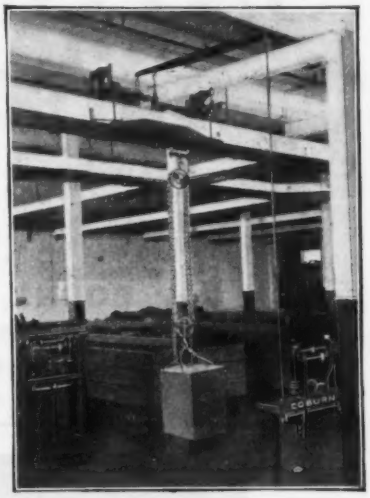
The Benevolent Giant can lift anything liftable; he can shift anything shiftable; he can move anything moveable; he can carry anything carryable; he can place anything placeable.

The Coburn Trolley Track lifting and carrying devices are simple, ingenious, and effective. With it one man does the work of three or four men, and does it easily.



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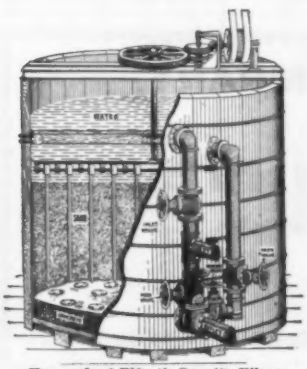

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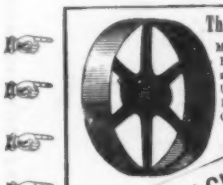

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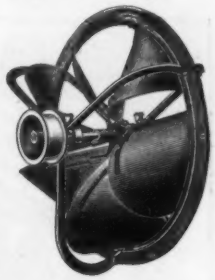

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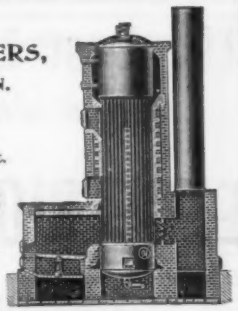

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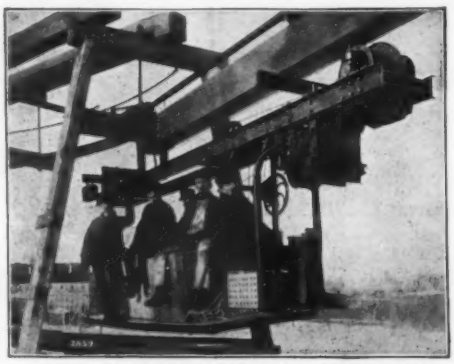

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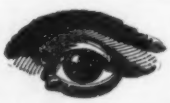
KEEP YOUR  ON THIS SPACE

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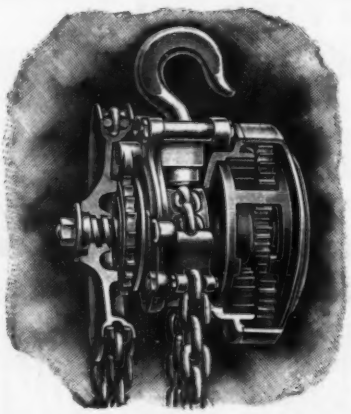

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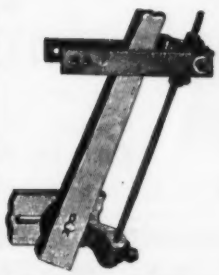

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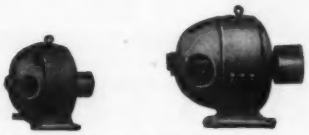

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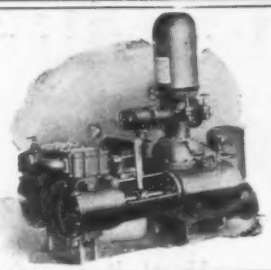

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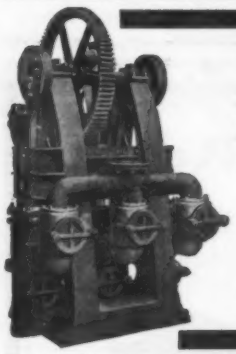

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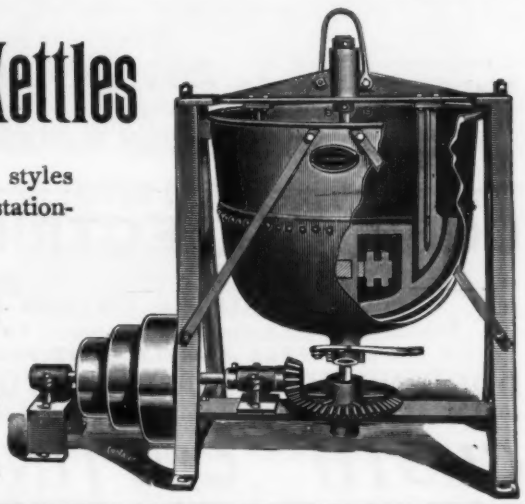

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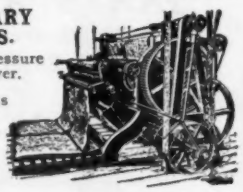

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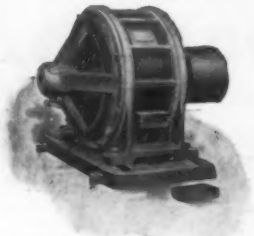

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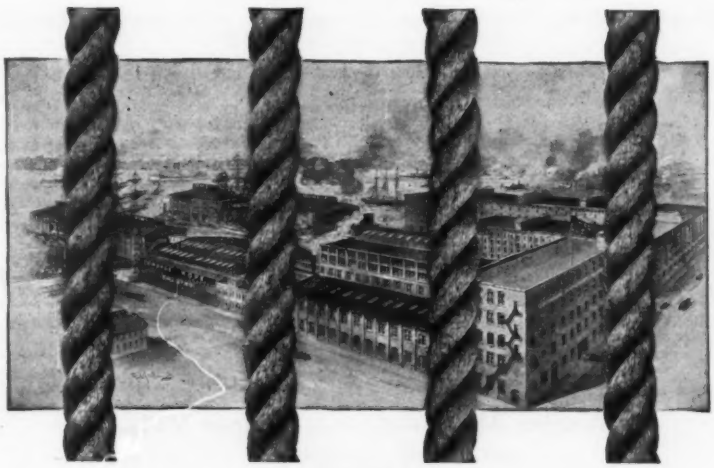

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TEXTILE WORLD RECORD.

Published Monthly by

LORD & NAGLE COMPANY,

FRANK L. NAGLE, President. HENRY G. LORD, Treasurer.

MAIN OFFICES:

299 Devonshire St., Cor. Summer St, Boston, Publication and Editorial Offices

425 Walnut Street, Philadelphia.

BRANCH OFFICES:

123 Liberty St., New York. 115 Dearborn St., Chicago.

Entered at the Boston Post Office as Second-Class Mail Matter.

SAMUEL S. DALE, Editor. E. A. POSSELT, Editor Process Department.

Subscription and Directory Rates.

The **Textile World Record**, including **Annual Official Directory** (Traveler's Edition),	$3.00 per year
The **Textile World Record**, without the Directory,	2.00 per year
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PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

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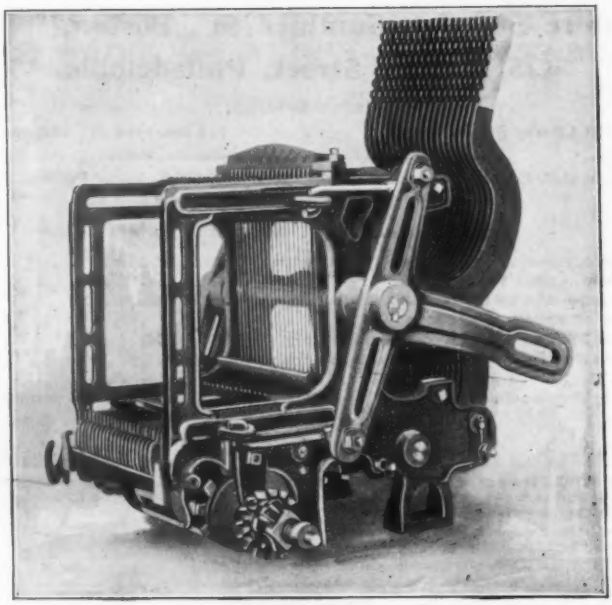

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VOL. 29. (NEW SERIES.) AUGUST, 1905 No. 5.

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In our May issue we called attention to the textile schedule of the new Philippine tariff, which is so framed as to increase the duty on standard American prints (56 by 56 and finer) about $6 per case. This increase was brought about by a change in the classification based on the set or threads per inch. This extract from the May article shows how it was done:

The following table shows the old and the new classification under paragraph 117, the rates of duty being the same in both the old and the new act:

	Warp and filling threads per inch.	
Duty per kilo.	Old law.	New law.
(a) 10 cents	up to 76	up to 76
(b) 14 cents	77 to 127	77 to 105
(c) 18 cents	128 to 160	106 to 160
(d) 28 cents	161 or more	161 or more

(e) 30 per cent. surtax if printed or manufactured with dyed yarns.

American prints are made in a wide variety of "sets," but the bulk of the business consists of three standard grades, namely: 64 by 64, 64 by 60, and 56 by 56. Counting both warp and filling as in the tariff act these three grades are as follows:

64×64=128 threads.
64×60= 124 threads.
56×56=112 threads.

Comparing these "sets" with the old classification it will be seen that the two lower grades (64 by 60 and 56 by 56) came easily into class (b) at 14 cents per kilo under the old law, while the 64 by 64 set came within one thread of it, and in practice the goods ran so that the 64 by 64 grade was also included in the same class (b). The new law, however, lowered the limit of class (b) to 105 threads per inch and thus transferred all three of these standard grades to class (c) with a duty of 18 cents per kilo. The difference between the two rates amounts to about 1/4 cent per square yard or $6.00 per case.

The new law applies to all goods imported into the Philippines, irrespective of the country of origin, and the change would have worked no hardship to American manufacturers were it not for the difference in manufacturing conditions between England and the United States. In England the mills make immense quantities of coarse goods for export, one means of cheapening production being to weave and print two or more widths together on special wide looms and printing machines, and then split them before shipment. The export trade of the United States is comparatively small and confined to finer grades of goods, similar to those used at home. England's exports of cotton goods amount to $360,000,000 per year, while those of the United States are but $33,000,000. American mills find it impracticable to instal the special machinery required for the manufacture of coarse splits for prospective export, and, consequently, the increase of the

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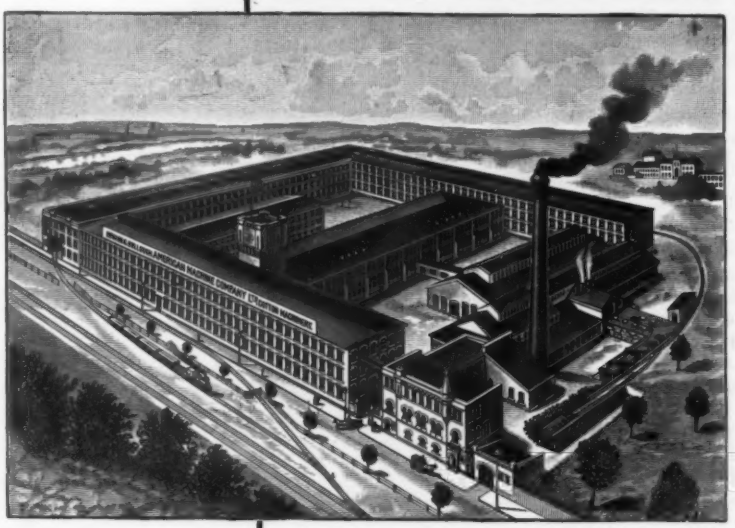

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Philippine duty on the finer grades is a direct blow at the export trade of this country.

The United States furnishes but a very small part of the cotton goods imported into the Philippines. Last year we supplied them with cotton goods to the value of but $362,282, out of a total of $5,500,656. Of this total nearly half came from Great Britain. Although we did not have the trade, we had hopes that eventually we could wrest this market from the foreigners and supply the Filipinos with American goods, but the unexpected juggling with the tariff schedules has done much to destroy even those hopes. If the British Parliament had framed the Philippine tariff, it could not have made the paragraph under consideration more favorable to British trade. Moreover, there is a large element of the ridiculous in the fact that the blunder was made at the suggestion of a leading American cotton goods commission house. The name of this firm we are not at liberty to disclose, but there is no reason to believe that the firm acted in bad faith. It was simply a mistake and was placed on the statute book because the framing of the Philippine bill was entrusted to the employes of the War Department, who lacked the necessary knowledge for the work. The bill thus drawn up was accepted by Congress and is now the law of the land until Congress sees fit to change it. Since the blunder was discovered an effort has been made to offset its effects by securing a ruling from the Philippine customs officers that would bring English splits under a higher rate, as has recently been done in Cuba. The matter is now being considered by the authorities at Washington. Manufacturers and others interested in the export trade should take immediate steps to have the whole question brought before Congress at the coming session and to have the error on classification corrected.

In Bavaria, Italy and France it is said that experiments are being made for the production of artificial cotton from the wood of the pine tree after the bark and branch knots have been removed. After it has gone through several preparatory processes it is as flexible as the natural cotton.

Textile Improvement Societies.

In another part of this issue appears an interesting letter from the secretary of an English local textile improvement society. This particular society is composed of members engaged in woolen manufacturing, but similar associations exist in cotton manufacturing centres, and indeed originated in this branch which has a number of organizations in different cotton factory towns. These societies are doing much to benefit ambitious operatives. They afford an opportunity to those who have not the time nor the means to attend textile or technical schools, and are particularly desirable for men who feel that they are too old to attend classes and yet wish to extend their knowledge of manufacturing beyond the particular department in which they are engaged. The club features, the getting together in a pleasant social way, give a different turn to the gatherings from strictly class work.

We do not recall any society in this country conducted on exactly similar lines, although there may be such. In Philadelphia and Providence there are local dyers' associations and in North Adams, Lowell and Lawrence we believe there are loom fixers' and weavers' clubs, but they are not so broad in their scope as these English societies seem to be. In this country mill centres are not so numerous as in England and it would be difficult to organize a successful society except where there were a group of mills engaged in either cotton or woolen manufacturing.

We too often hear it said by mill men that they have all they want of manufacturing at the mill, and once out of the mill they want to drop it and turn their thoughts to something else. This may be well enough for a man who has reached a place in life where he is content to let well enough alone, but even for him one evening a week spent in listening to some lecture or talk on some practical textile subject or the discussion of mill problems and questions with other mill men would surely be of some interest and certainly of more advantage than an evening spent in idleness or frivolous pleasure. To the young man who is ambitious to get ahead the opportunity to discuss with others of

greater experience and in different departments would be of great benefit. We hope to see societies of this character established on this side of the water.

Weavers' Wages in Belgium.

The attempt by a few cotton manufacturers at Ghent, Belgium, to introduce the four loom system into their mills has been opposed by the weavers, who insist that the change means more work and lower wages because of the reduced piece price paid when a weaver runs four looms, instead of three as is the custom in other mills. During a dispute over the same matter three years ago, the manufacturers published a statement of the wages actually earned by the weavers at that time under the three loom system. The operatives recently claimed that a comparison of the wages then with those earned now would support their claim of more work and less pay. One of the employers who operates a mill at Ghent and another in eastern Flanders, responded to this by giving out the following statement of the average wages earned by the weavers in each of his mills per week of sixty hours, during a period of four weeks:

Number of weavers.	Wages per week.
1	$3.33
4	3.60 to $3.80
3	3.80 to 4.00
13	4.00 to 4.20
18	4.20 to 4.40
18	4.40 to 4.60
16	4.60 to 4.80
18	4.80 to 5.00
19	5.00 to 5.20
3	5.20 to 5.40
1	5.40 to 5.60
114 Average	$4.60

The weavers in the country mill in eastern Flanders work sixty-five hours per week and with four looms to a weaver have earned the following wages:

Number of weavers.	Wages per week.
2	$3.76
8	4.20 to $4.40
7	4.40 to 4.60
9	4.60 to 4.80
5	4.80 to 5.00
1	5.00 to 5.20
1	5.20 to 5.40
3	5.40 to 5.60

In the same country mill the weavers working sixty-five hours per week with the three loom system received the following wages:

Number of weavers.	Wages per week.
1	$2.60 to $2.80
1	2.80 to 3.00
11	3.00 to 3.20
12	3.20 to 3.40
8	3.40 to 3.60
5	3.60 to 3.80
7	3.80 to 4.00
4	4.00 to 4.20
3	4.20 to 4.40

These figures tell a story of toil, poverty and wretchedness that no words can make plainer. Sixty-five hours of hard labor in a noisy, stifling weave room for three dollars and fifty cents. This condition of the Belgium weavers should be kept in mind whenever the proposition is made to tinker with the tariff that protects American labor against the pauper labor of Europe.

The Lace Industry.

Much valuable information on the manufacture and marketing of lace comes from the U. S. Consul at Nottingham, where practically all of the lace produced in Great Britain is manufactured. The exports of lace from the Nottingham district amount to 90 per cent. of the total for the whole country, and a large part of the remaining 10 per cent. from other places is made at Nottingham and included in mixed invoices of textile goods. There is a general belief in English trade circles that the British lace industry is declining, and this opinion is maintained in the face of an increase in the lace exports of $12,670,000 in 1903 to $13,500,000 in 1904. The increase is made to harmonize with the belief in the decadence of the industry by the additional statement that the increase in exports is due to the temporary increase in the demand from the Continent for nets. The decline in the trade with the United States is very serious, amounting to 20 per cent. for the first nine months of 1904. On this point the consul says:

> That the curtain trade with the United States is being destroyed by the American import duty is universally admitted, and protectionists reason that the lace trade in general would be improved by adopting the fiscal methods of other countries. Figures are quoted showing that Great Britain's

lace exports to protected countries are declining, stationary, or growing very slowly, while lace imports from those countries, excluding America, are increasing by leaps and bounds. French and German duties on lace goods, it is claimed, have drawn Nottingham machines to those countries, which now not only make laces for their own markets, but even flood the English market with their product. This view has taken such strong hold that practically all the local lace exporters are protectionists. The establishing of factories in the United States, where, it is said, the largest lace-curtain mill in the world is now located, has reduced Nottingham curtain exports thither to a negligible quantity. The only compensation is the export of machinery to America, but that is relatively small in value, and it involves, besides, the steady loss of expert British lace makers and draftsmen.

Among the other reasons given for the depression in the British lace business are the war between Japan and Russia, the drought in Australia, the dumping of foreign laces on the English market and their re-export as English goods, the stealing of English lace designs by foreigners, and the retention of out-of-date machinery by Nottingham manufacturers.

There is a tendency to extend the lace industry to other parts of the country outside of Nottingham, and this is explained by the strength of the Nottingham labor unions and resulting higher wages at that center, also by the lower cost of land and labor in the country. The lace curtain industry has in large part been transferred to Scotland, where the cost of labor is said to be but half the Nottingham rate, most of the Scotch lace factories being owned by Nottingham manufacturers.

The consul sums up the situation as follows:

> The disastrous effect of the dull trade upon the workmen is indicated by the statement that the financial help being given to unemployed lace makers is much greater than last year. In this city the outlay is more than the payments being made into the fund by employed workmen. Without speedy improvement, the out-of-work benefits must be materially reduced in amount.
>
> My own judgment is that the root of the trouble with the British lace business is the characteristic conservatism of the Englishman, which leads him to look askance at anything new, and his fixed confidence in the absolute superiority of everything produced in his country. I say this with the greatest liking for the Englishman. He is sincere, conscientious, enterprising when convinced, and thoroughly honest and honorable. I refer only to what may once have been an element of strength, but is now a weakness. He is beginning to realize this himself, and in that is his greatest hope for the future.
>
> The lace industry would, it is believed, be much benefited by some organized system of technical education. Some lectures on lace production and some lessons in lace designing are given here, but they are too irregular and sporadic to excite much interest or to be of material service. The present straits of the industry are directing public attention to the imperative need of measures to meet the tide of competition, and the thorough training of experts in lace designing and production is believed to be a prime necessity.

Crop Estimates.

The scandal in connection with the leak in the cotton crop estimates brings up again the question as to the value of the government's estimates to the trade. No matter how carefully guarded and well prepared the system of estimating may be, so long as quotations on the exchanges are influenced by these reports the danger of manipulation will always be present. The intent of the government's estimates is, of course, to give unbiased and early information of the great crops; their effect is undoubtedly to foster speculation. Reliable statistics as to the size of the crops after they are grown are desirable and necessary, but we question whether manufacturers are benefited by the advance estimates of the government.

In distinction to the violent and constant fluctuations in the cotton market which is reported and estimated to the last degree, is the comparatively steady trend of prices in the wool market where there is no official estimate or report and only such as come through channels of the trade and columns of the trade papers. In times like the present, there is undoubtedly much wool bought on speculation, and on the buyers' judgment of whether prices are going up or going down. But it is so in the case of every commodity and the buyer's good judgment constitutes one of the principal features of the merchants' or manufacturers' success. The speculation and dealing in wool is confined entirely to wool manufacturing circles, whereas the cotton market is now the field for speculation by thousands of people who cannot tell a bale of cotton from a bale of wool, and these outside speculators undoubtedly give great weight to the official estimates of the government.

If these reports were discontinued the trade would still not lack for estimates.

There are dozens of statisticians, many of whose reports are compiled with great care and thoroughness and at large expense. Most of these estimates are made in good faith, and yet they can be taken on the reputation of the compiler for what they are worth without the stamp of official authority, which, as in the recent instance, has proved to be misleading and undoubtedly disastrous to many people. We should like to see the experiment tried of omitting the cotton crop estimates of acreage and condition for a year or two and judge the effect on the market from a manufacturer's point of view.

The Cuban Tariff on Cotton Goods.

Since the close of the Spanish war, which freed Cuba, there has been more or less wrangling between the Cuban customs officials and the importers of cotton goods over the rate of duty on what are known as "splits," that is, cotton goods woven with centre selvages and split into two or more widths after coming from the loom. English and Continental goods are made in this way to a large extent, but the practice has not been adopted by American manufacturers.

A clause in the Cuban tariff provides "that tissues not exceeding 8 kil. per 100 square meters (15 lbs. per 100 square yards) and not over 65 centimeters (25 1/2 inches) in width shall be admitted at rates in paragraph 114." The controversy has been over the question of whether splits should come within the meaning of this clause. The rates on plain goods having 68 to 80 threads per inch (16 to 19 threads per 6 millimeters) under the two rulings are shown as follows:

	Under 114 per lb.	Not under 114 per lb.
From the United States....	$0.0878	$0.141
From other countries	.1255	.202

The European splits less than 25 1/2 inches wide were thus subject to a duty of 20 1/5 cents per pound if not under paragraph 114; or 12 1/2 cents per pound classed under that paragraph. The difference between the two rates is nearly 8 cents per pound. As the splits were not made in the United States the old classification affected only the goods from other countries and the difference was more than that afforded by the reciprocity treaty with this country. Thus a classification of splits under the clause mentioned made the rate 12 1/2 cents on European goods of that kind, while 14 cents per pound was imposed on American goods which were made in whole widths over 25 1/2 inches and not split.

The Cuban Government has changed the ruling several times. The latest order, a copy of which we have received from the American minister at Havana, imposed the higher rate on splits and is as follows:

CIRCULAR NO. 342.

(Translation.)

Habana, March 13, 1905.

Department of Finance,
Customs Division.

To the Collector of Customs at .....

Sir: Whereas on November 8th last, it was decreed by Circular No. 308 that the special concessions contained in Order No. 74 of March 16, 1901, of the late Headquarters of the Department of Cuba were not applicable to certain tissues appearing without the entire width of their manufacture and with but one selvage, the other edge being cut longitudinally.

Whereas it was afterwards decreed by Circular No. 320 of December 19th last, that the former circular should be understood as applying only to cut tissues and not to tissues called "splits" nor those having one selvage more or less perfected, all of which have widths determined in the manufacture.

Whereas protests and reclamations claiming that the latter circular does not truly interpret the letter and spirit of said Order No. 74, series of 1901.

Considering that it is indisputable from the examination of the data and information relative to the case that tissues called splits mentioned in Circular No. 320 should not enjoy the benefits of Order No. 74 because they are not original widths and consequently are without two selvages completely finished and perfected.

Considering that, notwithstanding what has been said, Circular No. 320 has created a condition to which the customs and commerce have accommodated themselves and that their position must be considered,

I have ordered that 90 days from the date of the publication of this Circular in the Official Gazette, Circular No. 320 cited, shall be ineffective and No. 308 again enforced in the sense that cut cloths and those called splits shall not benefit by the special concessions to which Order No. 74, series of 1901 of the extinct Military Government refers.

Respectfully,
J. Rius Rivera,
Secretary of Finance.

Whether the exports of American cotton goods to Cuba will be stimulated by this ruling, which goes into effect in June, remains to be seen. The reciprocity treaty provides that woven cotton goods from the United States shall be admitted at a rate of

duty 30 per cent. less than from other countries. This looks large, but as the regular Cuban rates are low to begin with the 30 per cent. amounts to much less than might be supposed. It is on the right side, however, and it is up to our manufacturers to get what advantage is possible from the concession granted under this reciprocity treaty.

Oriental Silks in France.

For some years the tariff law of France has allowed the importation of so-called unfinished silk goods from China and Japan at reduced rates. The original object of this provision was to encourage the French dyeing and finishing industry. The law was framed with the idea that the Eastern fabrics, after having been dyed and finished in France, would be exported to other countries. While this has been the case to a certain extent, large quantities of the goods have been marketed in France and come into direct competition with the products of French mills. During the past year the silk goods imported into France from the extreme Orient were valued at $10,000,000.

In response to the outcry raised by the Lyons manufacturers, the government on September 5, issued a notice that the duties on the Asiatic goods would be increased on October 15, 1904. This led the importers to enter a vigorous protest against such a sudden change, they claiming that it would cause great loss on account of the pending contracts for future delivery. Recognizing the force of this claim, the government issued a second order postponing the increase on the tariff rates to January 1, 1905. The position of the silk manufacturers is stated in the following petition addressed to the government by five representative silk organizations of Lyons:

The associations of weavers of Voiron, Tour-du-Pin, Bourgoin, Pont-de-Beauvoisin, Lyons and the Lyons district, representing 25,000 power and hand looms, by which 100,000 workmen gain their living, in reply to the protest of the commercial associations of Paris beg leave to submit that:

1. The commercial associations of Paris represent the consumers of silk fabrics known under the name of pongee, corah, and tussah and are not manufacturers of these goods.

2. The signers of the protest against an increase of the tariff rates represent only the large importers who, under the operation of the tariff of 1892, have made immense profits to the detriment of the treasury by reason of the low rates on silk goods from the extreme Orient.

3. It has been proved that, contrary to the statements of these commericial associations, the mills of France are able to manufacture goods identical with those imported from the Orient.

4. The importations of these goods from the extreme Orient have been steadily increasing for the last ten years and during the current year were valued at $10,000,000.

5. The manufacture of these goods in France would give employment to 10,000 looms.

6. That the depressed state of the weaving industry has caused a serious reduction of wages in the mills and it is the duty of the government to help them by removing the tariff discrimination against the products of their labor.

7. The dyeing and finishing industries would not be injured by the removal of the discriminating clauses in the law. The proposed amendment of the law removing this discrimination would tend to improve the general industrial condition of the country, and would not injure in any way the trade in these fabrics. We, therefore, protest with the utmost energy against the efforts of the Parisian syndicates, who endeavor only to increase their wealth to the detriment of the nation and to the vital interests of the workmen. We express our regret that our adversaries have won a victory by which the removal of the discriminating clauses in the law is postponed until January 1, 1905, and we beg to state that, as this postponement removes the principal argument of our opponents, namely, that the early application of the decree would interfere with impending contracts, we hope that in the interests of the French weaving industry there will be no further delay after January 1, 1905.

THE COTTON MANUFACTURERS' MEETING IN ATLANTIC CITY.

The 79th meeting of the New England Cotton Manufacturers' Association will be held in Atlantic City, September 20 and 21. Arrangements are being made which promise to make this meeting of unusual interest, and the selection of this well-known and attractive resort, situated so conveniently for Philadelphia and New York manufacturers, will doubtless bring a large attendance from those sections as well as New England, and it is hoped that many Southern manufacturers will also be present.

Arrangements have been made by the Association to have their headquarters at the Chalfonte, one of Atlantic City's most modern hotels. This well-known hostelry faces directly on the ocean and is well adapted for such a large and important gathering. The hotel is beautifully appointed and has the reputation of being among the best there. We bespeak a large attendance for this meeting and feel sure it will be one of the most successful yet held

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

Considerable interest is manifested in the new lines, which are now almost completely opened. As generally expected, quotations are on a higher level, showing advances all the way from 7 1/2 per cent. to 20 per cent.

No material activity is apparent as yet, but it is stated that some numbers proved themselves so popular that the season's product was contracted for in a few days, and is already withdrawn.

Comparing the volume of business already transacted at this time with former years, it is undoubtedly very satisfactory, but it appears that many of the orders placed are conditional and subject to revision and cancellation; which cannot possibly be satisfactory to the manufacturer. Buyers adopt this measure in order to protect themselves in case of a decline, notwithstanding the protestations of the selling agents.

The present high quotations on the raw material will most probably last for several months, but the outlook for a recession in price is by no means unreasonable.

Thus far the tendency in favor of worsted fabrics is most pronounced, while serges and thibets have shown unusual strength. The so-called mercerized worsteds have been bought in large quantities, notwithstanding the hard criticism of several of the leading clothiers.

The new quotations made by the American Woolen Co. on pure dyed goods are as follows: Thibets, 12 oz., 92 1/2 cents; 16 oz., $1.32 1/2; 18 oz., $1.42 1/2; and on staple Nos. 7212 14 oz., $1.07; 7214 16 oz., $1.20. The popular line of 11-oz. serge known as 3192, which sold last year at $1.02, is now shown at $1.25, with the probability of another advance in the near future. Some of the numbers which have proved popular with the buyers are 711 at $1.17 1/2, 411 11-oz. serge at 92 1/2 cents; 114 12-oz. at $1.50, 712 12-oz. at $1.25, 714 14-oz. at $1.40. The following are the new prices on Clays: 11-oz. $1.20, 12-oz. $1.27 1/2, 14-oz. $1.42 1/2, 16-oz. $1.22 1/2, 18-oz. $1.30. The new lines brought out in Clays: 716 at $1.15, 14-oz. $1.30, 14-oz. $1.42 1/2; line 416 is quoted at $1.00, $1.10 and $1.22 1/2 in the same weight.

The worsted mixtures from the Washington Mills are shown in a very extensive range, comprising both plain and fancy weaves and colorings, grays being predominant, the 10-oz. goods ranging in price from $1.02 1/2 to $1.75. The Weybosset cloths are shown in department 3, division 2, at $1.40, $1.57 1/2 and $1.72 1/2. The Coronet mercerized fabrics are quoted at 80 cents, 85 cents, 90 cents and $1.00. Herbert E. Peabody quotes the mercerized lines of the Shelburne Mills at 87 1/2 cents to $1.12 1/2 and the Ashaway woolens from 57 1/2 cents to 95 cents.

Thomas Ould has opened two new lines of worsted mixtures, which are spoken of most favorably by the buyers, one of which is a tropical weight light gray at $1.12 1/2.

The Gilbert Manufacturing Co. opened their spring lines as follows: Line 22,820, 70 cents; 9240, 77 1/2 cents; 14,640, 92 1-/2 cents; 21,670, $1.00; 22,990, $1.02 1/2; 18,530, $1.17 1/2; 17,417, $1.25; 21,650, $1.35; as compared with last year, these lines show advances of 12 1/2 to 22 1/2 cents. It is announced that the above lines are sold up and withdrawn. Lines of mercerized cassimeres are shown at 95 cents, velours at $1.12 1/2 and $1.17 1/2, double and twist cassimeres at $1.32 1/2 and $1.17 1/2, coverts at 90 cents, $1.00, $1.30, $1.32 1/2, $1.50 and $1.75.

The Ashtabula Worsted Mills, sold through Frith & Wiegand, have produced a line of gray serges at 95 cents, which is attracting the market's attention.

A new line of Old Town Woolen Mill goods has been opened by Greely, Cushman & Record. "Noil suitings" they are called, at 53 cents net.

Snedeker & Orchard have opened the Sunset cassimeres at 65 cents, in silk noil, double and twist effects; also Morton worsted trouserings at 97 1/2 cents. Both of these lines are 14-oz. goods.

The new imitation fur lining for cloaks made by J. J. Dobson and called "Dobson

cloth" is a production of mohair and wool; the sale of this is reported as unprecedented.

Stevens, Sanford & Jordan are showing Farwell fancy worsteds at prices ranging from $1.12 1/2 to $1.25. Three new lines of serges made in the Middleboro Mill at $1.20, $1.30 and $1.37 1/2 have been sold up and withdrawn. This same firm has shown this season thibets that are favorably spoken of by buyers who have inspected the entire market.

Cary, Deuscher & Dennis have opened all the piece dyes, serges and unfinished worsteds of Thomas Oakes & Co., at prices ranging from $1.27 1/2 to $1.82 1/2. The regular numbers show an advance of 20 to 25 per cent. over the opening prices of last year, but there are several new lines offered at points around the $1.50 mark. Buyers have bought up these fabrics rapidly and no doubt the lines will be withdrawn shortly.

H. J. Libby & Co. have opened the Indian Springs' 12 1/2-oz. goods at 85 cents and $1.00; Eastern Star, 11-oz. at 80 and 95 cents. These goods are all in smooth-faced effects and are different from last year's fabrics.

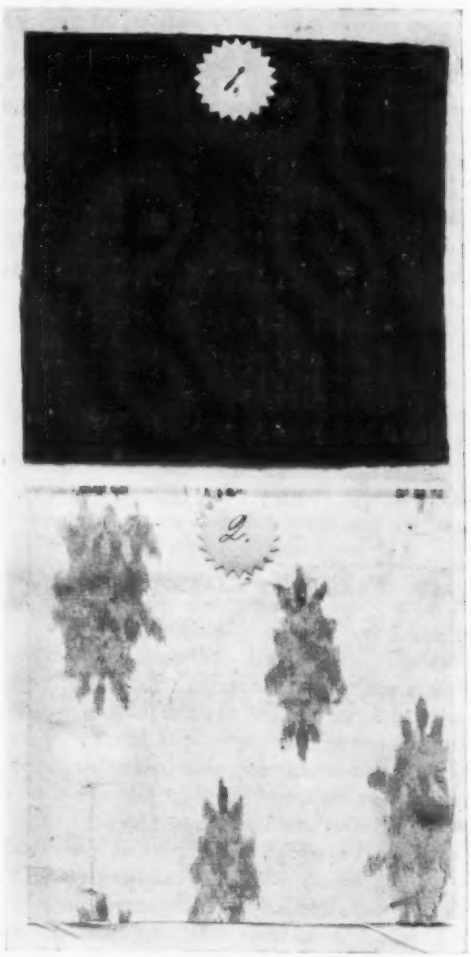
Four lines of wool goods, several lines of flannels, also some wool serges at prices ranging from 50 cents to $1.50 have been opened by Deering, Milliken & Co.

The Blackinton Manufacturing Co. opened last Wednesday their line of outing flannels and wool fabrics, weighing 9 1/2, 10 1/2, 11 1/2 and 12 1/2 ounces, at prices ranging from $1.25 to $1.75.

DRESS GOODS.

The situation of this division of the market is spoken of as being moderately satisfactory, although no active development of spring weights has as yet materialized. This, however, is the period in which the buyers from all over the country visit the market, with the result that the outlook for further business is most encouraging. Most of the representatives of both the importers and manufacturers have now returned, some of whom pronounce their lines as being most successful.

The present overskirt dress style naturally calls for materials that drape well and effectively, hence the strong demand for broadcloths, drap d'ete, prunellas, henriettas, batistes and others of the soft chiffon finish. It may be said that as a general rule the new lines are developing strongly in the way of light weight and smooth faced materials. This is undoubtedly a plain goods season, and a large volume of the yardage calls for monotones, black being predominant, but



during the month both jobbers and the cutters have shown increased interest in two-toned novelty suitings on the order of Fig. 1, which is a 54-inch wide fabric at $1.12 1/2, made by Franklyn Glazier & Son, and sold through Fleitman & Co. Such fabrics are eminently suitable for tailored costumes, and the continuance of this style in a minor degree is promised for another season.

One of the features of the past month has been the increasing request for gray shades, and the manufacturers have found it difficult to supply the demand.

Plaids, both in tartans and checks, have also developed considerable strength, more especially in dark colors.

French serges, the Panama weaves and granites, are all selling well for the fall season. All these are standard staple fabrics and are sold over the retail counter the year round.

The importers of mohair claim that there has been little diminution in the request for their lines, and speak confidently of another prosperous season, although mohairs have already enjoyed a lengthy run in popular favor. The call for Sicilians and plain mohairs during the month has exceeded the most optimistic expectations.

SILKS.

The condition of the silk market has materially improved, and every indication points to a successful silk season. The developments have been in the direction of the soft weaves, such as satins, messalines, chiffon taffetas and crepe de chines. There is also a revival in favor of moires, in both plain and figured. The orders placed for plain taffetas have already exceeded the most sanguine hopes, while peau de soie and peau de cygnes in both black and colors have received steady support.

The popularity of fancies during the past season has induced manufacturers to turn even more attention than usual to creating novelties and fabrics of a unique and distinctive character. Among the print warp collection of Cheney Bros. are such designs as Fig. 2, width 21 inches, and sold at 85 cents. In a measure these are revivals of the Dresden vogue of several years ago, with the color combinations materially improved. Clan plaids have been bought extensively in a large variety of styles and qualities.

The vogue this season is for designs of the more pronounced order. The hair line, small checks and small jacquard patterns of last season are almost entirely obsolete; while the call for the Persian printed warps and other large designs is in the ascendant. Pompadour prints are well thought of and some of the manufacturers have made a specialty of these designs. Very beautiful styles are shown of such by Rogers & Thomson, agents for the Clifton Mills.

The leading colors in dress silks will be all kinds of blue, the latest being sapphire, green and a new mulberry shade, brown from tan to the darkest, and lavender in the purples to prune.

VELVETS.

Pile fabrics promise to be equally as successful as they were last fall, and costumes of chiffon velvets and velveteens will be much in evidence with the coming of the cold weather.

COTTONS, WASH GOODS AND PRINTS.

The cotton market is in an exceedingly strong position, with prices advancing all along the line, with the result that many buyers have been caught napping. During the month there has been a scramble for goods, and owing to the recent strike at Fall River the stocks with first hands are clean, hence desirable tickets are hard to secure. The probabilities are that the present situation will last for several months, or at least until the new crop is marketed.

The prices demanded by the selling agents on cambrics, dress ginghams and fancy cottons of various kinds are fully 10 to 15 per cent. more than the same goods sold for at this time last year.

Preparations are now being made in the dress goods division of the cotton market; and it is stated that several large factors have placed their contracts for the spring of 1906. These orders, however, are conditional and subject to revision, with prices in each instance guaranteed. Buyers realize the necessity of protecting themselves in case of shortage and adopt this method to cover.

It is also true that many lines of spring goods are placed on the market as early as Nov. 1, more particularly dress and shirting ginghams, but these are looked upon more as staples, and the request is in a measure continuous.

The Glasgow manufacturers are now exhibiting their spring lines, and their collections are most extensive. Two styles of

shirting percales, produced by William Anderson & Co., in their mill at North Adams, Mass., are especially worthy of mention. These are printed single or double faced at 10 1/2 cents and 11 1/2 cents respectively.

WHITE GOODS.

The business transacted in white goods is eminently satisfactory, and considerably in advance of the same period last year. Dotted Swiss has had a most remarkable run, and though the season is drawing to a close many requests are still being made for popular price numbers, ranging from 10 to 15 cents.

Plain India linons and sheer fabrics of a similar nature are considered leaders, and the bulk of the business booked is for such goods. It is more than probable that before many months there will be a scarcity of such fabrics, more particularly of India linons, as there is just now barely enough to go round.

Neat designs in fancies are shown by the manufacturers, and every indication warrants the statement that next spring white goods generally will be the vogue more than ever before.

LININGS.

During the past few months business with the converters has been of a more hopeful nature; although there is no great activity apparent, yet there is an increased interest in linings that has been absent for a long time.

The mercerized goods are almost perfect at a very moderate cost. Frederick Butterfield & Co. show several under the tickets of Manhattan silk at 15 cents, cobweb and coolie silk at 22 1/2 cents and 25 cents respectively. The finishing of the percalines is also of a high standard.

A. G. Hyde & Sons have recently introduced a beautifully finished percaline under the ticket of "Heatherbloom" and sold to the retail trade at 21 cents.

The Gilbert Manufacturing Co. has built a large business on a similar fabric under the trade name of "pres de soie," sold to the trade at 20 cents. These are widely advertised in the prominent periodicals, and have achieved a widely deserved reputation.

THE EXPOSITION AT LIEGE, BELGIUM.

BY FREDERICK CARRINGTON.

(Specially Reported for the Textile World Record.)

Lacking the proper enthusiasm, the big Belgian textile manufacturers were caught napping by their powerful French rivals and only discovered the fact too late, when the Liege Exposition space was all taken, France securing the greater part. Practically the only contestants for honors in the textile field at this fair are the home country and the republic to the south. Although the large firms of Verviers, Ghent, Brussels, Tubize and other Belgian cities have made elaborate exhibits, the French firms have doubled the displays of the former, with the result that their exhibit is much more comprehensive and produces a much finer showing.

The secret of this coup on the part of the French manufacturers, as confessed by the head of a leading Belgian firm, is that the Belgian companies themselves did not strongly believe in the success of the Liege Exposition, while their rivals, on the other hand, were enthusiastic from its conception and decided to make the greatest exhibit their immense works had ever established. Elaborate as was the French textile exhibit at St. Louis, the one at Liege is superior to a certain degree.

The exposition, as a whole, is excellent. It is located in one of the most charming spots of one of the most picturesque and beautiful little cities of the Netherlands, and, as some travelers have pronounced it, in all Europe. Her wealth of historical, educational and remarkable manufacturing and mining features, and quaint social and economic phases have been practically unknown to the traveler, as Liege has been off the general route of travel lovers. The city has finally awakened and is now inviting the world to see her as she really is.

St. Louis with her $50,000,000 presented to the world a gigantic and brilliant creation. Liege with a quarter of that sum has produced a much smaller exhibition, but one select in all phases and artistic to a high degree.

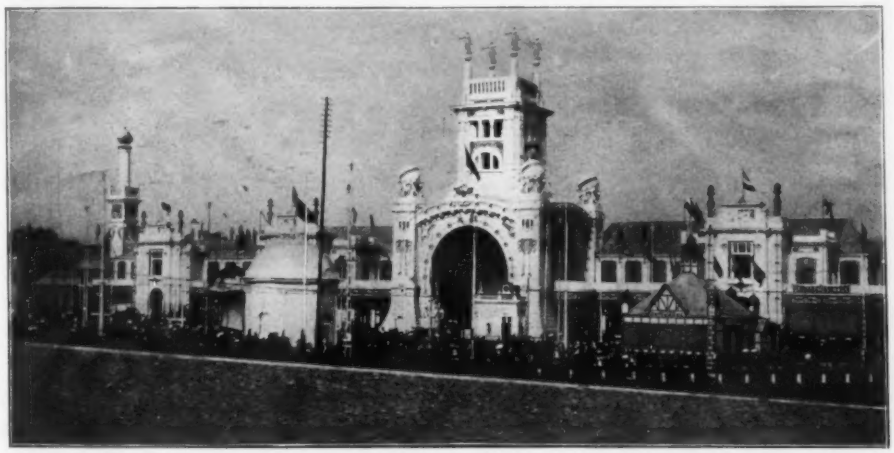
Waterloo and the sites of other tremen-

dous, bloody engagements of the past are within an hour's, or a few minutes', ride by train from the exposition city. Liege itself, by means of its battle-scarred walls and citadels, bears silent witness to the struggles of its citizens against Spaniards, Normans, or more ancient foes. Then, in its old religious, educational, and world famed music institutions lie numberless intellectual treats. It is scarcely a day's walk to France or to the English Channel, and is the gateway to the charming "playground of the Ardennes" with its noted Spa, a watering place of extreme beauty.

Liege is called the Pittsburg, or Birmingham, of the Netherlands because of her extensive plants and factories. This would seem to imply a grimy, air-befouled, ugly town, but contrary to expectations, it is a beautiful and picturesque city. It is situated at the confluence of the Meuse and Ourthe Rivers, which wend their way lazily, in serpentine fashion, through valleys shut in by high bluffs. The city is ensconced in a funnel of green hills, the exposition lying exactly at the juncture of the two streams. The rivers give a delightful Venetian setting, and a lovely little public park adds the artistic touch of nature bestowed upon the St. Louis exhibition by its Forest Park.

The city is most accessible to visitors. It is close to all the main lines leading everywhere over the continent and is only a few hours' ride by train from Paris and London. As a strategical point, it is of great importance, as it commands all the principal roads to western Europe. With its sister city, Antwerp, it is one of the two chief defensive positions of the kingdom. It is in the heart of the Walloon country and its climate is delightful, the air being pure and invigorating.

As a preparation for its exposition, Liege and the national government, at great expenditure of wealth and labor, dug a new channel for the Ourthe River and bound it in securely with walls of granite. This was done chiefly to reclaim lands from the water's grasp, for increasing the fair grounds. They have also constructed canals and locks to facilitate passenger and freight traffic and have erected splendid granite and steel bridges connecting the divisions of the grounds.



THE GRAND FRONT OF THE EXHIBITION PALACE.

Cost of living at Liege is slightly less than at St. Louis, but the expenditures necessary in seeing the exposition are far smaller. The gate entrance fee at Liege is one franc (twenty cents) as compared with fifty cents at St. Louis. Refreshments, including luncheon dishes and drinks, are in most cases less than half, and often superior in quality to most supplied at the American fairs. A particularly enjoyable phase of the refreshment feature at Liege is the system of open-air cafes.

Under the grateful shade of wide-spreading trees and beside the river bank or tiny lake are laid the tables with their viands.

As to actual size the Belgian fair falls far short of the immense Louisiana Purchase Exposition. The former has 170 acres for its buildings and grounds, while the latter had 1,370 acres. On account of its small area and compact form of exhibit palaces, the Liege Exposition obviates the great fatigue incident to the sightseeing at St. Louis. For lack of huge proportions and brilliant display, the Belgian has endeavored, and very successfully, too, to provide visitors with a select exhibition. The workmanship is done with care and a painstaking effort to reproduce as exactly as possible the permanent.

A VIEW IN THE EXPOSITION GROUNDS.

The exposition site has been laid out in a rather peculiar and unique manner, there being five sections in the general scheme, four separated from each other by the two rivers, and the fifth entirely divorced from the general grounds, being located a mile away on the crest of a high wooded bluff. Entering by the grand porte, or gateway, the visitor passes through the first section, which, though in no regular design like the Pike at St. Louis, contains most of the shows and other amusements. The handsome new Fragnee Bridge, over the Meuse River, which cost $600,000, carries the sightseer to the second section, a wedge between the Meuse and Ourthe, which is occupied by Vieux Liege, or Old Liege, a reproduction of the city as it was 600 years ago. This attraction corresponds to Jerusalem City at the Louisiana Purchase Exposition. Leaving this division by another bridge over the Ourthe, the sightseer steps into the third section and on the right finds a majority of the exhibit halls in close formation. Turning to the left he passes down a handsome avenue, Quai Martiva, with abundant shade trees and landscape gardening effects, and finally reaches a suspension bridge, again over the Ourthe. This point leads into the most charming, most soothing spot imaginable. It is the park stretching between the banks of the Ourthe and Meuse Rivers, containing within its wealth of verdure the foreign pavilions and

the fine arts and ancient arts halls and many open-air cafes.

The last section of the exposition is laid out, as stated, upon a high bluff overlooking the rest of the fair. It is reached by an electric tram, or, if the sightseer prefers to walk, by a broad, winding causeway. The view alone from this hill, or Cointe, as it is called, is well worth the trip and small extra gate fee.

A striking architectural feature of the exhibit palaces is that they either all dovetail together or are connected by halls, which are also used for exhibits. In order to visit all the main palaces there is no need of going out into the hot sun. The scheme has been, apparently, to make the interiors, rather than the exteriors, elaborate. Much of the fine statuary and other staff work at the Louisiana Purchase Exposition are missing here. With the exception of the grand front the exteriors of the exhibit buildings are quite plain. The interiors, however, with draperies, flags, bunting and excellent painting and frieze work, have been made ornate and artistic. The exhibits also have been arranged artistically. Considerable material seen at St. Louis is here again on display, but there is much new, however, some remarkable displays having been made by European institutions, which did not appear at the American city.

Belgium, France, Germany and Japan are vying most strongly for honors. Great Britain has a very inadequate exhibit, considering its commercial prominence and the United States has one scarcely worthy of the name. So poor is the representation of the union that an American official, visiting Liege, told the writer he was ashamed to meet other foreign officers in the American section. The only redeeming features of the United States display are the machinery and modern art exhibits. There is a very fair display in Fine Arts palace and several patriotic American firms, including Brown & Sharp of Providence, R. I., and Pratt & Whitney of Hartford, Conn., and a group of firms, represented by Fenwick Freres of Paris, have also made a fair showing in the machinery hall. Neither the United States nor Great Britain are officially represented. It is understood that Great Britain intended originally to make a large exhibit, but on account of some misunderstanding with the Belgians, dropped her plans. Canada, however, under government patronage, has erected a large pavilion and arranged a fine exhibit, which has been pronounced by a Belgian professor in the Liege University as the best feature of the exposition. The general exhibit of the United States covers a small space in the grand palace and comprises largely of little optical booths and souvenir stands. A few typewriter firms, and the National Cash Register Company have installed small exhibits. The evident lack of interest among the English and Americans has created much disappointment and no little criticism after the large foreign exhibits at St. Louis.

THE RIVER MEUSE.

For Belgium, in the textile field, Ghent takes the lead for the cotton industry and Verviers for the woolen. Ghent was, centuries ago, the oriental seat of the textile industry of Belgium. During the 16th century when Emperor Philip II of Spain sent the ruthless Duke Alva to subdue the ever revolting Belgians, many expert textile workers of Ghent fled to England and other countries. Nearly the entire woolen industry of that city, as well as of Louvain and Dam, was lost, and has never, to any great degree, been revived. The cotton industry was maintained. Several large "Drapers Halls," as they are called, are silent memorials to the lost immense woolen business.

Liege and Roulers linen manufactures are also represented. Large cases of raw or whitened thread of two grades—that produced from the Russian flax and from the native Belgian plant, which is superior to the

former, are shown. Most of the Russian material on exhibit comes from Riga. Courtrai, the largest Belgian flax producing centre, has well displayed her resources. This city lies on the Lys River, whose water is splendidly adapted to the softening and further preparation of flax. The flax for the thread in the finest Irish linens, particularly from the Belfast centres, comes from this thriving little municipality. The market is so important that many English and Irish buyers have homes in Courtrai and spend much of their time there. With this fine flax the Irish make better linens than do the Belgian manufacturers, who are close beside the flax producing district. Though the Belgian is striving strenuously to discover the cause of the

THE BAKER AND HIS TEAM.

inferiority of his finished product, he has so far failed to do so. Courtrai is likewise well represented in linens and cottons. Elaborate displays of striped and fancy design drills for mattresses have been made.

In cotton prints Brussels has an attractive exhibit. The Societe de la Senne, a large firm, is the leader among the capital's exhibitors in this cheap line of goods. Colored blankets and ladies' light dress goods are also in the list of displays that attract immediate attention. The exhibit of the Artificial Silk Company of Tubize, a small town near Brussels, is interesting not so much so on its own account but because of the remarkable success of the company, which holds the secret process. Though the corporation has only been operating its plant between four and five years, it is now paying to its stockholders, it is stated, 100 per cent. in dividends. Its management is preparing to enter Japanese markets, in the belief that they can compete successfully with the Mikado's silks.

The wool centre, Verviers, is well represented, though not as extensively as the visitor would imagine that its many establishments would warrant. The city is about thirty minutes' ride by train from Liege. It contains, approximately, 100 plants for the woolen industry, and its annual output per year, as estimated by the secretary of its chamber of commerce, is about 100,000,000 francs, or $20,000,000. Twenty years ago the worsted branch of the industry was introduced and now there are thirty-four plants turning out this material. The bulk of Verviers' product is cloth for the masses. Some finer goods are made there, however. Peltzer and Fils, the largest company in Verviers, is the chief exhibitor.

The displays showing the various stages in the use of wool are cleverly arranged. The raw material for the Verviers' manufacturers is secured chiefly in La Plata in South America, Melbourne, Sydney, and African and other South American colonies. A certain amount comes from France and Germany, however. For the washing of wool Verviers has a 12,500,000-cubic metre reservoir, called La Gileppe. The water is soft and excellent for cleaning and carbonizing. Suitings from Verviers are also nicely displayed.

From the Belgique section the visitor goes to the French and at once is struck with the greater scope and more elaborate scheme with which the French manufacturers have laid out their exhibits. The system of arrangement is more comprehensive and more effective. Greater space is allowed here even than at St. Louis, which improves the exhibit as a whole.

Roubaix and Tourcoing, which are so close together that they are associated as one big textile centre, with their joint population of 300,000, lead in woolens. These two cities have taken the laurels from Sedan and Elbeuf. The latter are still important woolen cities.

but their former fame has been somewhat eclipsed lately by Roubaix and Tourcoing. In a measure these two latter municipalities have been injuring Verviers and other Belgian towns because of the fact that they are drawing to themselves many skilled workmen from the latter by offering higher wages. Of late there has been quite a serious emigration of Belgian workmen to the French centre. To stop this the home manufacturer may be forced, as little as he likes to do so, to likewise hold out higher inducements. It is more or less a fight for the best skilled labor. It is estimated that there are at least 50,000 Belgian Flemish workmen at the two popular French cities and nearby towns. Tourcoing has become ambitious for a fair and next year, from April to September, will hold an exhibition devoted to textiles.

Lille is doing the chief honors in linens, while Beauvais has a fine exhibit in blankets. The Chamber of Commerce of France at Reims, the famous wine centre, has made a handsome collective exhibit of woolens and cotton flannels, one of the most showy displays in the section. Eleven firms are here represented. The exhibits of coatings and other heavy tissues are elaborate as are also the cases of cassimere and similar cloth. A large and comprehensive display of curtains made of jute is shown by Dents-Benoist of Roubaix, and veils and shawls are advantageously exhibited by the firm of Philippe Benedictos of Lyons.

In the French textile exhibit there are represented about 100 firms, of which number about fifty had displays at St. Louis. In textile machinery, Belgium and Germany only have entered displays. The former are showing looms, cards, sizing and starching machines, and machines for making cordage. Several machines for the lace industry are in Germany's general exhibit.

A phase of the Liege Exposition which is well worth considering is the commercial bureau. This institution, the Belgians claim, is original with this fair. A bureau or department with a large staff of attendants, trained in commercial pursuits, has been established in the central part of the exhibit palace scheme. Here is found a large library containing books on commercial subjects and long tables covered with numberless trade journals and papers in French, English and German. All visitors and exhibitors are welcome to use this library as freely as they desire. For a pittance exhibitors may rent a small compartment in which to place catalogues, tariffs, prospectuses, photographs, and, in fact, any advertising matter they choose to distribute. The attendants see that this literature is given to visitors, who desire information about certain firms. Lists of all exhibits, in classified form, are also supplied to all who call, to facilitate sightseeing along certain lines.

If visitors wish to meet exhibitors, the bureau places them in communication with the latter. It is a desire of the bureau to do away, as far as possible, with the squandering of catalogues incident to most expositions. In case visitors seek to inspect plants or factories at Liege or near by cities, the bureau arranges for their admission to the same, greatly aiding the commercial man who is looking for new ideas and investigating conditions away from home. Further, the bureau has established a special service dealing with all questions concerning transportation, freight and customs, which is given gratuitously. En resume, as an official of the bureau said to the writer, "This department was organized and is administered in such a way as to afford visitors and exhibitors every facility to collect useful information and develop their commerce."

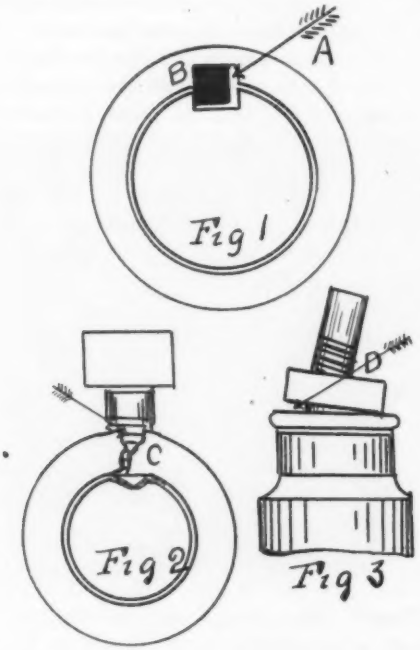
In the early part of the seventeenth century the Dutch were competing so strongly in woolen manufacture with England as to arouse some indignation, one writer of the day protesting that "this Cloath-Trade is our antient Right and did always belong to our Nation and no other People in the World could in Reason pretend to the Manufacture of it."

According to Chinese history Si-ling chi, wife of Hoang-ti, was the first person who discovered and raised the silk worm, about 4,000 years ago. She was honored by being named the "Goddess of the Silk Worms," and the feeding of the worms on the annual return of the festival is still observed.

THE MECHANICAL END OF THE TEXTILE BUSINESS.

BY AN OBSERVER.

The accompanying illustrations were made from some power-losing elements that I observed in visiting cotton and woolen mills lately. As is known to the engineer and the machinist of the modern mill, there have been many changes in increased speed and improved machinery in the last few years, resulting in definite adjustments of parts. The day of botch work in the power system



long since passed. However, in visiting some of the modern mills, the writer occasionally observes instances of loss of power and defective adjustment. In Fig. 1 is shown the connection effected with a muff coupling for the purpose of running a countershaft for some spinning mules.

The self-operating mule requires a steady driving power, as is known. In this instance there were four Johnson and Bassett 350-spindle mules to be run. In the construction of the muff coupling, a most perfect adjustment is required, otherwise trouble will ensue. The muff couplings are turned down to the right size and set. In this case the correct fit was made, but the simple defect in the key caused the union to be unsteady. The mule fixers had tinkered at the head motions of the mules, belts had been tightened and shippers altered. Finally an examination of the muff coupling was made and it was discovered that some one had inserted a key, B, that was too small. The key failed to fill the seat, thereby leaving the space at the arrow, A, open as shown. A new key of correct size was substituted, after which the mules operated steadily. This slight defect is mentioned, because in all my travels among the mills I found that little oversights of this nature prevailed as a rule. An important imperfection is readily noticed and rectified. The little fractures and trifling misadjustments are quite often passed over.

In another mill I observed that some cast iron collars were employed in a place where brass or kindred metal collars ought to have been used. These cast iron collars were provided with no strengthening shoulder. The result was that the majority of the collars were cracked as at C, Fig. 2, and the parts sustained by them were loosened. I found the cause to be due to the fact that in most instances the point of the set screw had gouged out a depression in the shaft. Then when a strain came, the point would ride the depression to the higher level of the shaft surface, causing the expansion of the collar and fracture of the same. This was overcome by putting on brass collars.

Then there is the troublesome lock-nut. The lock-nut may be seen in use in the shaft hangers, the journals of looms, mules, cards, and in fact all parts of machinery in the textile mill. As a rule the lock-nut holds well, but in a special case the lock-nut failed to hold to its seat. The conditions were as in Fig. 3. The stud is bent in exaggerated form in the cut so as to illustrate the point more readily. So long as the lock-nut fitted snugly to the base, it held its own, but one day the stud became bent a little, thus permitting one side of the nut to free from the seat as at D. This reduced the frictional contact between the surfaces and the nut persisted in turning itself loose. As soon as the stud was straightened the trouble ceased.

Then there are the minor troubles with belts. I found numerous instances of belts slipping due entirely to some minor defect. A much better and more accurate adjustment of belts is required for the speedy modern machinery of the textile mill than formerly. We used to let belts run in a slipshod way.

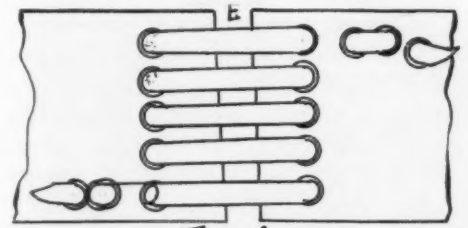


Fig 4

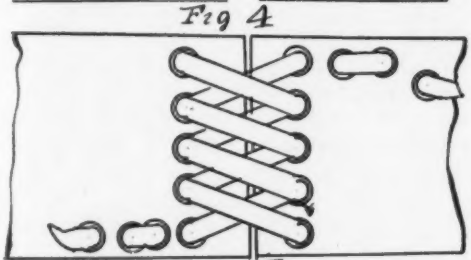


Fig 5

Now, in order to get the best results, not only the belt proper must be superior in grade and possessed of power to grip the wheel surfaces in good order, but every detail of connection and operation must be right. Otherwise we get just what so many manufacturers are getting; namely, poor service from good leather or rubber belts. The owner of the mill will sometimes buy inferior grades of belting and expect as good results as from high grades. I have seen single belts struggling with heavy work where double belts ought to be used, just because the single belt is so much cheaper. I have seen 4-inch belts used where there ought to be 6 or 8-inch belts and for the same reason. Sometimes the economy of the owner or manager is overcome by the workman who puts a double system of belts on one drive. Then again it is pure carelessness of the workman that makes poor service. At Fig. 4 we show how even a first-class belt can be made to do second rate service. The workman in sewing the ends has left open the space at E. Every time this gets around the wheel surface, it is quite sure to slip a little and create an unsteady motion. The system of lacing is right, and the union would be perfect if closed. In Fig. 5 we show a good plan for belt sewing. This process of lacing can be followed from the plan.

I found gears running in all sorts of ways. Some were made to bind too much as at F, Fig. 6, and grinding and grating resulted, as well as absorption of power. Then some of the cogs barely touched as at G, Fig. 7, causing "riding" of the teeth at times. The happy medium of adjustment is the only right way for gears. I found gears with cogs worn as at H, Fig. 8. If a gear has important work it should be replaced with a new one when the cogs are in this shape.

There were instances of wobbling shafts in

Fig 6 Fig 7 G Fig 8

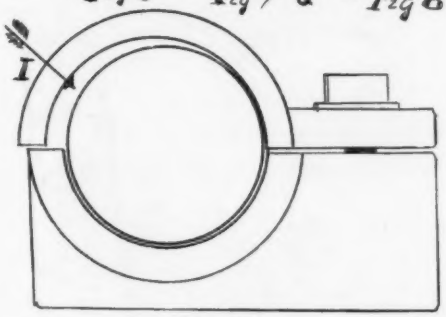


Fig 9

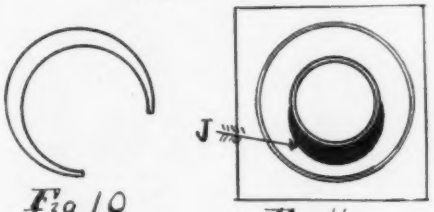


Fig 10 Fig 11

loom, causing a harsh pick. In one loom the fixer in his haste has clapped on a cap of too large size, making the fit incorrect as at I, Fig. 9. Just as soon as the right cap was substituted, the loom ran right.

I found pieces made from metal in moon shape, as in Fig. 10. These were fitted into journals to take up the wear of the metal as

at J, Fig. 11. In nearly every instance the action of the revolutions of the shaft would cause the inserted half-moon part to bind and create a heated bearing. I should avoid these wedge-shaped affairs. Fig. 12 shows the way I saw a struggling belt fixed. The belt was originally adjusted to run on the large wheel with a contacting surface from M to K. This belt slipped a great deal. Finally an idler wheel was put up at P on a countershaft and this made the contact of the belt with the large driving wheel from M to N,

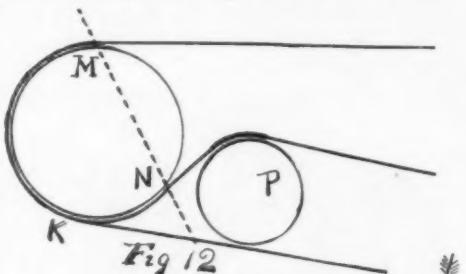


Fig 12

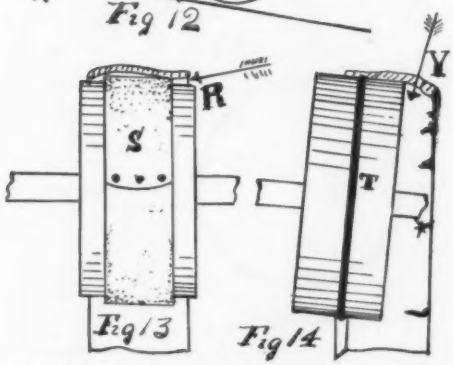


Fig 13 Fig 14

after which the belt did good service without slipping. Fig. 13 illustrates how a man in charge of the power of a textile mill lagged a pulley to get more service out of it, in preference to putting on a larger wheel. He riveted the belt leather on, as at S, but covered only the middle of the wheel. The belt was a double one, and being rather stiff, rode the lagging, leaving the sides free from contact with the wheel surface as at R. And the man wondered why his belt slipped more than ever.

Then again the combination shown in Fig. 14 came to my notice. The belt took to the low side instead of the high side of the wheel, as at Y, because of the peculiar conditions existing. There was a leader at T, but the shaft alignment was incorrect. The shaft tilted just enough to make the low side as shown. The drag on the belt caused it to assume the attitude illustrated. As soon as the shaft was aligned correctly and the leader removed, the belt ran on the centre.

BRADFORD DRESS GOODS.

(Specially Written for Textile World Record.)

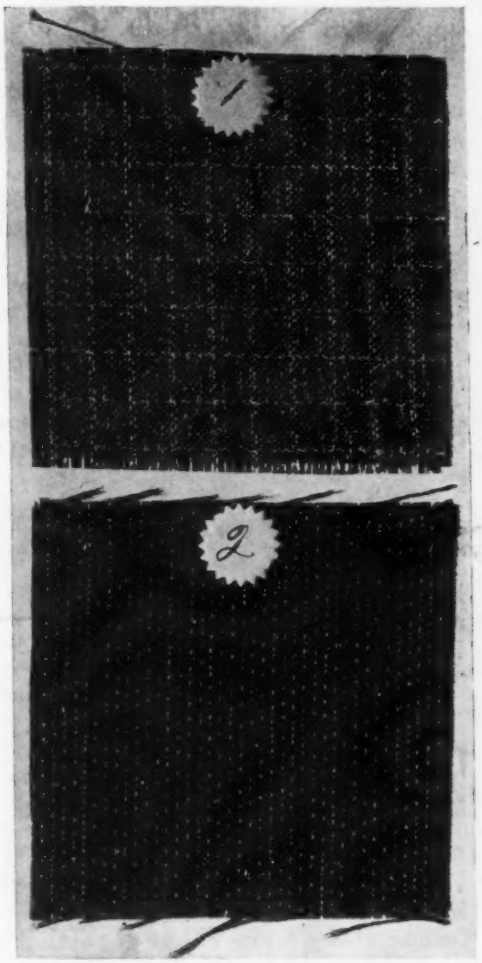
A FEW LEADING SAMPLES CONSIDERED.

No United States manufacturer can have watched the exports from the Bradford Consular District for the past twelve months without noticing the largely increased exports of dress goods, and they show that either America is consuming more textiles, or else that Bradford manufacturers can still beat their American competitors, notwithstanding the heavy import duty which they have to face. The general opinion in Bradford is that dress goods manufacturers in New England have still very much to learn in the way of producing these goods, and but for heavy import duties American mills would be "licked" completely. Without laboring the point, let me tell your readers that our designers, manufacturers, dyers and finishers never turned out better goods than they are doing today, and only let fashion favor Bradford made goods and looms here will boom again.

It is well known that lustre goods have played a prominent part in the list of exports from Bradford during the past year, every firm producing mohairs—such as Saltaire Mills, Mitchells', Benns', Priestleys', etc.—being very busy indeed. Needless to say the variety of goods shipped is legion, ranging from 24c. per yard up to the finest $1.50 for Priestleys'. The cheapness of raw mohair has been a wonderful help in enabling them to do a big volume, it now being a question, with the raw material advancing, as to whether the returns can be kept up.

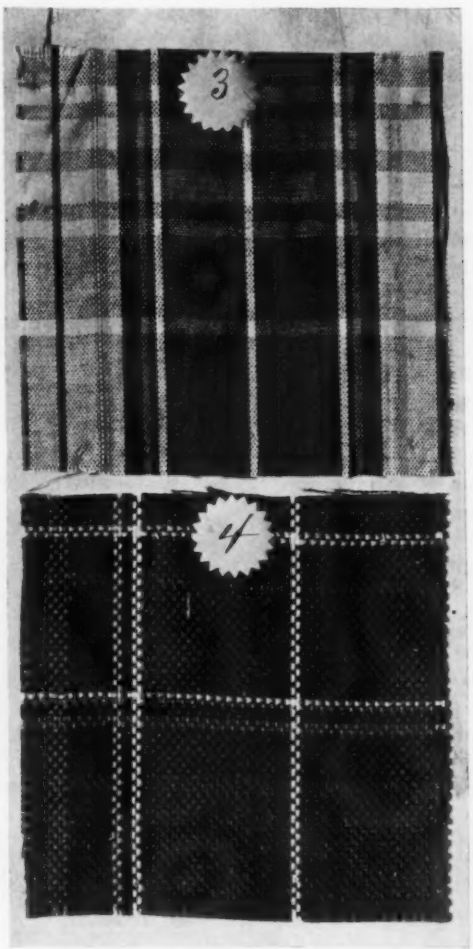
Nothing struck me more the other day while going through a big pile of patterns than the very smart and dressy fabrics which were being shipped "at a little price." I was not so much concerned with the better class fabrics as the lower priced ones, because every manufacturer knows that if he has a fair price to work to he can avail himself of all the good materials that nature has pro-

vided. To my mind a manufacturer's ability is demonstrated most, when he handles successfully cotton and shoddy, in other words, when he produces something smart and salable out of practically nothing. In two cloths at least to which I desire to call the reader's attention we have some smart dress goods



which for ingenuity of construction cannot be beaten anywhere.

The first sample, Fig. 1, is indeed a very tasty character, and the effect is made entirely with printed cotton yarns. I never saw the like of this fabric before, and those who could see it would agree that it is an ingeniously constructed dress fabric. As I said before the warp is composed entirely of small spun cotton yarns which have been printed to imitate a kind of woolen twist, the colors being blended so nicely as to give a very pleasing effect. The weft is all worsted or worsted and mohair, and being finished with a clear surface, the appearance is really good. The cloth baffles my powers of description, but I am able to say that very large quantities of this cloth, and in many shades, have been sent



to the United States. No man can expect a great deal for 25c., 46 inches wide, but this fabric is all right for any one wanting a cheap, fancy dress piece.

The next cloth, Fig. 2, is of the same breed, excepting that it is more of a bird's-eye character, and a little heavier. To my

mind this is not so attractive as the previous pattern, still some big weights have been taken. The most surprising thing about these two fabrics is the unique way that cotton printed yarns have been used, something that I have never seen done before. This class of yarn just at present is being used for all it is worth, and United States manufacturers should for themselves see the effect they produce.

Fig. 3 brings us into the region of Scotch plaids or tartans, and what loyal Scotchman, or rather Scotch lady is there with a drop of real Highland blood in her veins who would be without her tartan dress at 11c. per yard! This class of fabric does not appeal to me, only it serves to show what is being done, and considering the colors employed, together with the raw material, weaving and finishing, the price is indeed a little one. The yarns have the appearance of being mercerized, and cheap it is.

The next tartan fabric, Fig. 4, is altogether different from the previous one, and is much heavier. When I first picked up the fabric I thought it was made from worsted, the handle being so soft and woolly, but on closer examination I find that only cotton yarns are used. The color blendings are perfect, and that is saying a great deal. The cloth is woven with the hopsack weave, and presents an appearance that is highly pleasing. Considering dress goods in general that are being shipped to the United States, one thing at least can be said, and that is that importers are getting remarkable value. American manufacturers might to advantage study the composition and blending of these dress materials.

It is impossible to discover when the custom of wearing clothes was first introduced into England. Caesar wrote that "the Britons in the interior of the country are clothed in skins."

With the exception of the dog, no animal has so wide a range as the sheep, extending from Iceland to the Equator, and from a few degrees south of it to the southernmost part of South America.

DAMASK FABRICS.

BY L. A. W.

Damask fabrics can be classed among the most useful of textile productions. Not only are they comparatively simple in structure, but when properly constructed are capable of unlimited ornamentation. The appearance of the damask fabric can be traced in the older types of the diaper to which it owes its introduction, but it was the invention of the jacquard loom that made possible the production of goods of the description of those at present in vogue.

The diaper was really the forerunner of the damask, both fabrics being reversible. This feature of the damask is not always retained. Upon examination of the true diaper it will be seen that the warp and weft flush is the same on both sides of the fabric. The damask cloth on the other hand is made with large figured designs. As the figuring generally occupies a large part of the surface, the ground taking up the rest, these fabrics differ materially from those of the diaper class.

A peculiar feature of the damask which enhances the attractiveness of the design is the effect produced by the varying reflection of the light. This effect in damasks in which warp and weft are of one color is perhaps second only to that obtained in pile textures, which have cut threads. When viewing a piece of cloth of the damask type the ground and figure, that is, the warp and weft, appear to be composed of differently colored yarns. When a close examination is made it is apparent that this is due solely to the light which, falling upon the threads, is reflected back to the eye in opposite directions, the shades varying in depth according to the position in which the cloth is placed.

Innumerable pleasing effects are obtained by variations in the weave. By an alteration of flush, either in the warp or weft, a surprisingly different number of shades can be produced. The rep weaves used for these fabrics are classed as warp and filling reps. When the rib runs across the piece it is known as a warp rep; when it runs lengthways of the pieces, a weft or filling rep. Damask cloths are sometimes made entirely

with the rep weave, but in some figured goods it is used in combination with other weaves. The satin weave is extensively used for damask fabrics. No other weave can produce the effect obtained from this mode of interlacing and at the same time retain an evenly balanced structure. Damasks of a typical structure are to be seen in which the satin commands the warp and weft of the entire fabric and when this is the case they are generally termed perfect. Cloths built from this weave are set full up to the diameter of the yarn and are woven in either silk, cotton, linen or worsted yarns or in a combination of any two of those mentioned. The greater number are produced from cotton or worsted yarns, the last being composed chiefly of yarns of the same color for the warp and weft.

Such weaves as twill and crepe are sometimes used as ground weaves, but this is the exception rather than the rule. The satin and rep give a more useful and effective appearance. The twill is mostly found where a diversity of shading is desired and is a very helpful weave for introducing a varied character to damask. Crepe is a weave of a broken character and is not very often used as shading. The interlacings of this weave are more frequent than those of other weaves and are apt to spoil the symmetry of the fabric. Another useful method of shading can be obtained by extending the floats of the satin weave. This method is often adopted and ensures an even balancing of the texture.

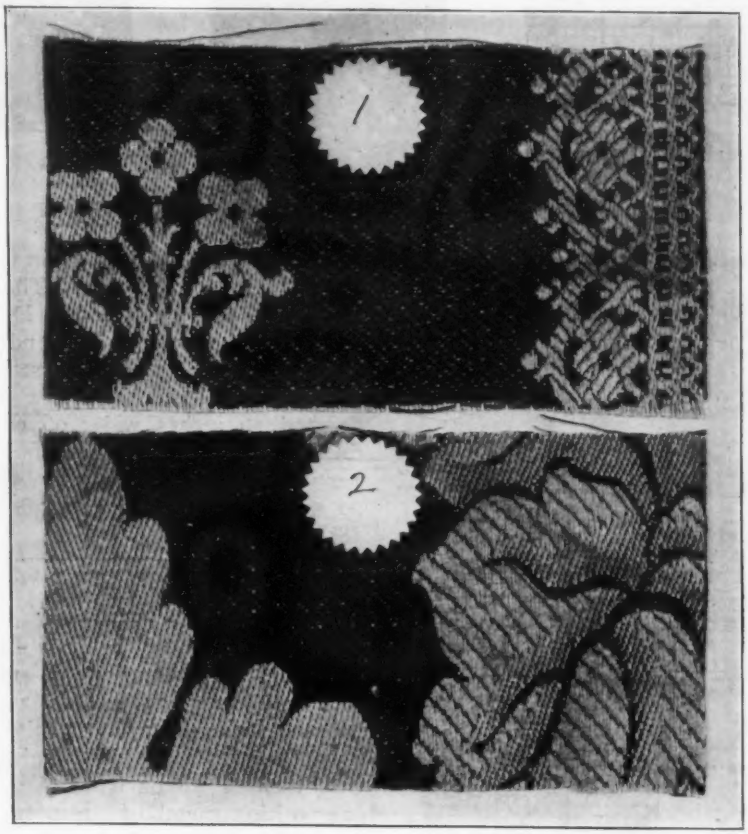
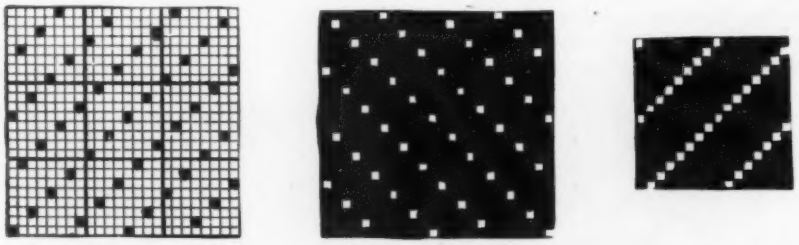


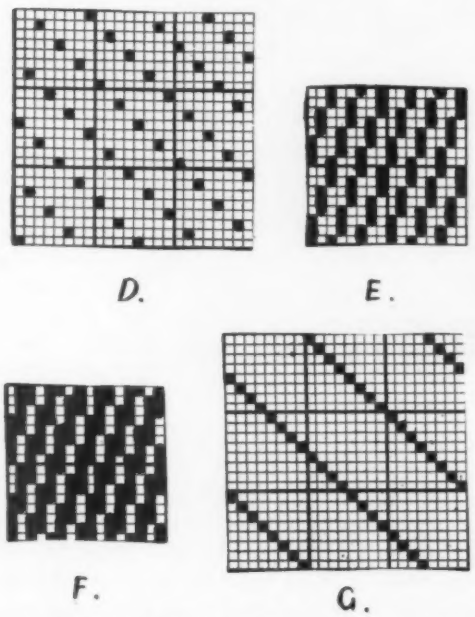
Fig. 1 is a cotton damask cloth and is of the warp figured class of fabrics. The red weft which has been mercerized is of single yarn, whereas the white warp is 2-ply. The mercerized cotton is an excellent substitute

for silk in these fabrics. The red weft also shows to advantage in conjuction with the white cotton warp. The weaves required to produce this cloth are: A, the ground weave, 12-end weft satin; B, figure weave 12-end warp satin; C, twill for border. Reed width, 64 inches; cloth finished 56 inches wide; 88 ends per inch in the finished state; 96 picks per inch; 4 ends in each split; 19 splits per inch; weight per yard, 11 ounces; warp, 2/45 cotton; weft, 17s cotton.



A B. C.

Fig. 2 is also a cotton damask cloth. The warp of this cloth is 2-ply white; the weft is green mercerized cotton. This makes a pleasing weave contrast which has been greatly enhanced by suitable shading and twilling. The pattern has been woven on the centre "tie-up" principle of drafting, the advantage of which is that it allows a design to be produced whose number of ends before one repeat occurs is exactly twice the number of hooks in the jacquard machine. A disadvantage of this method, however, is apparent when the weaves begin to reverse, the centre being too distinct. The weaves and particulars of this cloth are: D, 12-end satin weave for the ground; E, 8-end shaded satin for figure; F, 8-end shaded satin for figure; G, twilling. Reed width 64 inches; cloth finished 56 inches wide; 96 ends per inch finished; 100 picks per inch finished; weight per yard, 11 1/2 ounces; 4 ends in each split, 20 splits per inch; warp, 2/38 cotton; weft, 18s cotton.



D. E.

F. G.

BALE TIES.

A great many of the New England mills in the last few months have substituted for sisal and jute rope the De Haven "Trojan" bale tie, manufactured by the De Haven Mfg. Co., 52 Columbia Heights, Brooklyn, N. Y. This tie or band is a soft pliable composition metal of great strength, from one-half inch to one inch wide, and is put up in large coils the same as rope. It is fastened by an interlacing buckle. The black or oil finished band is used for domestics, and the wiped galvanized, which has a fine silky finish, is used for export goods. Mills using this new device claim it saves a great deal of burlap, that it makes a more compact bale and is much cheaper than rope.

During the reign of Elizabeth the exportation of live sheep and wool was prohibited on pain of having the right hand cut off.

VARIATIONS IN GOODS MADE OF THE SAME MATERIAL.

BY N. REISER.

The complaint is often made that in the manufacture of medium and fine goods in which silk or cotton threads are used for fancy effects these fancy threads are not the same in different pieces, in fact, vary in the same piece Owing to these variations the buyer frequently refuses to accept the goods. The causes of this trouble may be classified as follows:

1. A variation in the twist of the fancy yarn. Assuming that the 2-ply worsted in the fancy yarn has 15 turns to the right per inch, and that this 2-ply is twisted with a single thread 15 turns to the left, all the twist is taken out of the worsted by the second twisting so that the worsted fibres lie parallel with each other. The fancy thread then lies twisted around this 2-ply worsted and has a soft foundation into which it sinks partially out of sight. The case is entirely different, however, if the third thread is twisted say 20 turns around the same 2-ply ground thread. The increased twist the second time hardens the worsted by giving it a twist in an opposite direction and the single fancy thread is in this way made more prominent. This increased twist causes the single fancy thread to show more plainly on the face of the goods.

2. The tension of the thread, particularly of the single fancy thread, has an important influence on the appearance of the yarn in the cloth. Taking the case cited in the previous paragraph and assuming that the single thread is finer than the 2-ply, there will be a constant tendency for the tension to vary during twisting, the silk or cotton thread being thinner it will slip between the rolls because the pressure comes on the coarse thread. This difficulty is often partially remedied by winding the fancy thread around the upper roller or around an extra upright roll behind the delivery roll. This arrangement gives good results when the yarn runs regularly from the bobbin and the winding around the extra or upper roll does not cause tangling of the thread. The best method, however, for ensuring equal tension is to run each thread through a separate pair of rolls. This plan has the advantage of enabling the speed of each thread to be varied independently of the other thus producing a wide variety of different effects with the same yarn. It is important in making fancy twist that an accurate record of the twist and relative speed of each thread be kept so that the twist may be duplicated whenever required. In making fancy yarn silk should be kept under greater tension than is advisable with cotton yarn. The silk has less twist and is also more elastic than cotton. If a fancy thread made with a single cotton twisted with a fancy thread under high tension is used for warp there is danger of the cotton thread breaking during weaving and causing an imperfection in the goods. In passing through the eyes of the heddles the spirals of fancy yarn sometimes become displaced causing bunches which show in the goods.

3. Irregularities in fancy yarn can also be caused in both warp and filling by the ground thread. If, as is often the case, the goods are made with a cheap filling consisting of a mixture of shoddy and cotton and the color of the woolen material is not fast to acid the dye is apt to stain the fancy thread. This difficulty frequently develops during finishing. If the goods are allowed to lie in the wet state, especially in the soap, the fancy threads will often be stained. To prevent this goods containing fancy yarn should be extracted and dried as soon as possible. Such goods must not be boiled as this process in almost every case injures the color of the fancy yarn.—Leipziger Monatschrift fuer Textil-Industrie.

Barege, an open fabric resembling gauze, but more open in texture and stouter in thread, takes its name from the district in which it was first made, the village of Arosons in the valley of Barreges. It was first used as an ornament for the head in sacred ceremonies, especially in baptism and marriage.

The first French patent obtained by M. Chardonnet for the manufacture of artificial silk was in November, 1884. Since then he has taken out eleven other patents for additions to the original process.

A SILK WEAVING MILL.

The silk weaving mill built by Otto Honnegger-Egli in Hauptwil, St. Gall, Switzerland, and shown in the accompanying plans, is distinguished by a convenient arrangement of the machinery. The construction is very simple and consists of a rectangular building with two corners broken. To the main building, which consists of one large room, is joined a small two-story annex, the ground floor of which is divided by the passageway, Q, separating the offices, P and R. The office, R, is connected with the second story of the annex by a circular staircase.

On the second floor is a designing room where patterns and sketches are prepared and stored. Next the annex is an open stairway to the cellar which extends the whole length of the mill between the middle row of posts. This cellar is used for the storage of goods, the damp air imparting weight to the material while it is being held for shipment. The architect of this Swiss silk mill has taken the precaution to provide the cellar with drains so that the surface water will be carried off and the mill will thus avoid getting too much of a good thing.

The mill is laid out for 84 power looms, part of them for narrow and part for wide goods. The looms are arranged in double rows so as to give wide alleys for the transportation of beams and cloth. The preparatory machinery consists of two winding machines of 120 spindles each, 34 feet long and 4 feet wide. The filling spools for these machines are carried to four silk warpers, the whole being connected with beamers. The connection of the winders with the warpers is very convenient. The spools can be placed on the rack of the warper without being carried any distance. The looms are divided into two large groups between which are placed the drawing-in frames and nine filling spoolers, each of which has 25 spindles, and is 10 feet long and 3 feet wide.

In the rear are the toilet rooms, S S′, a plan of which is shown at Fig. 7, an elevation at Fig. 5. The posts divide the room longitudinally into nine spaces: one of 17 feet; seven of 15 feet; one of 17 feet. Crossways the room is divided into five spaces: one of 10 feet; three of 16 feet, and one of 10 feet. Lengthways there are two looms in each space. As each loom is 5 1/2 feet deep, there is a space of 4 1/2 feet to accommodate the weaver and warp beamer, which is ample for this purpose.

As shown at Fig. 8, each pillar rests on a cement foundation, 28 in. by 28 in. and consists of two parts, which, as shown at Fig. 4, are fastened together at short intervals. At a height of 14 1/2 feet the roof beams rest on the posts. These are No. 20 I-beams and the spaces between them are filled with cement. Above the beams are placed wooden rafters by which the desired pitch of the roof is obtained. These rafters are covered with 2-inch plank, on which one-inch sheathing is placed crossways. Next comes the usual covering of wood cement which deserves special mention because the severe climate of Switzerland necessitates an especially good roof. The outer walls are lined with corrugated brick. The saddle towers in the roof are of a new design by Sequin-Knobel. They are easily cleaned and operated and thorough ventilation is obtained by means of swinging windows. These ventilators are shown by the cross (×) at Fig. 4.

The water is carried from the roof by cement pipe placed in the supporting columns. As shown by the ground plan, Fig. 6, 6-inch (u′, w′) and 7 1/4-inch (u, w) cement pipes with a fall of 1 1/2 per cent. are laid next to each row of posts and connected with a 12-inch perpendicular pipe (x), and with the opening (y), 16 in. by 16 in. These serve partly for ventilation and partly for carrying off rain water. The openings (y) are connected with the drain made of 7 1/2-inch cement pipe.

The motive power is supplied by a petroleum engine of 40 H. P., which drives the dynamo and also the machinery. A turbine water wheel is installed in the power house, A. Owing to the irregular supply of water the engine is used nearly all the time, although the capacity of the water wheel is sufficient for driving the entire mill. The power is transmitted by belts over four lines of shafting. It is interesting to note that in this mill the half-turn belt has been deliberately selected. It is said that by this arrangement

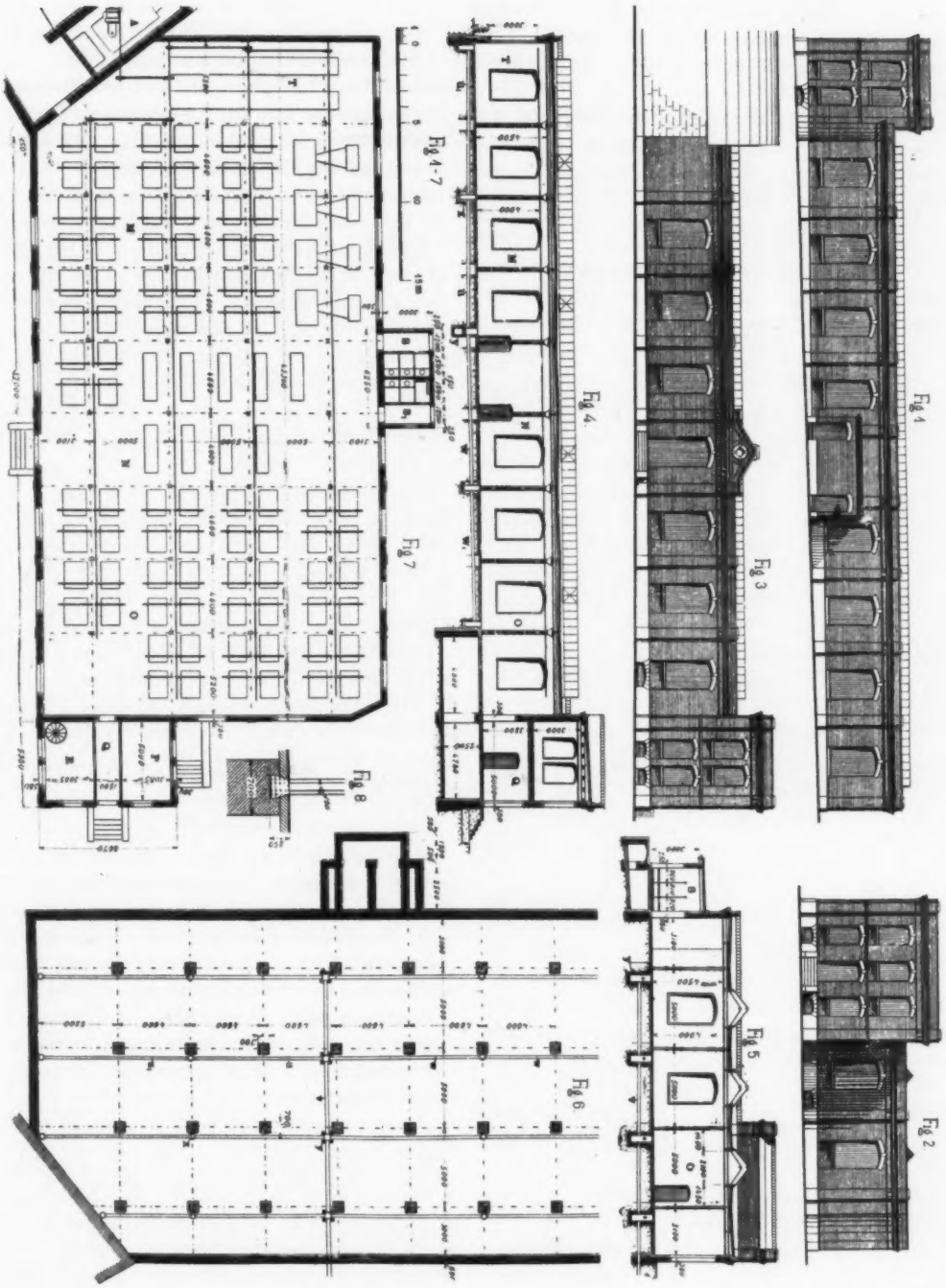


Fig 1
Fig 2
Fig 3
Fig 4
Fig 4-7
Fig 5
Fig 6
Fig 7
Fig 8

there is a saving in power and less columns are required in the mill. The belts also take up less room in the mill, and there is better light. These advantages outweigh the loss resulting from the greater wear on the belting.

Figs. 1, 2 and 3 are exterior views of the mill; Fig. 4 a longitudinal section; Fig. 5 a cross section; Figs. 6 and 7, plans.—Translated by the Textile World Record from Uhland's Technische Rundschau.

HEMP IN THE PHILIPPINES.

(From a report by H. T. Edwards, Fibre Expert of the Bureau of Agriculture, Manila.

Abaca (Manila hemp) enjoys the unique distinction of being strictly a Philippine product. The plant has been introduced into India, Borneo, the West Indies, and other parts of the world, but only in the Philippine Islands has the fibre ever been successfully produced as an article of commerce. This fact has undoubtedly been of great advantage to the Philippine planter. The lack of competition, however, has resulted in the continuance of obsolete methods of cultivation and fibre extraction better suited to the eighteenth than the twentieth century.

The opportunities for increasing the production of abaca in the Philippines are almost unlimited. Enormous areas of good abaca land are yet untouched, while the greater part of the land already under cultivation might yield a greatly increased product if more careful attention were given to the various details of cultivation. The introduction of irrigation would make possible the planting of abaca in many districts where it is now unknown. The perfection of a machine for the extraction of the fibre will increase the entire output of present acreage by nearly one-third, as that amount is now lost by wasteful hand stripping processes at present employed. In each successive step, from the first selection of the land to the final treatment of the fibre, the progressive planter should have, as his ultimate object, the production on a given area of a maximum quantity of superior fibre at a minimum cost. With the industry established and conducted on this basis, abaca will continue to hold its place as the first product of the islands.

HISTORY.

The first authentic account of the use of either abaca or banana fibre in the Philippines is that given by an Englishman, Dampier, who lived in Mindanao, in 1686. This writer described the "banana textoria," both as an edible and as a fibre producing plant. One of the companions of Magallanes, Antonio Pigafita, prepared a description of the plants of the Philippines, but in this paper no mention is made of abaca. The fibre was first exported from the islands about the beginning of the last century, but the exports did not become important until about 1850. In 1820, a sample of abaca was brought to Salem, Massachusetts, by John White, a lieutenant of the United States Navy.

The numerous attempts which have been made to introduce abaca into other countries have never met with any considerable degree of success. In 1822 experimental plantings were made in Calcutta and in 1877 in Madras. The plant grew fairly well in both instances but the fibre produced was of an inferior quality. The experiments with abaca in the Andaman Islands, Borneo, Florida and the West Indies have not resulted in any general introduction of the plant into these countries.

CLIMATE.

A suitable climate is the first and most important requisite for successful abaca cultivation. In selecting the location for a plantation this subject should receive the most careful attention. The four conditions of climate which directly affect the growth of abaca are the amount and distribution of rainfall, the degree of atmospheric humidity, the frequency of heavy winds, and the degree of temperature.

SOIL.

Next in importance to climatic conditions is the selection of a suitable soil. The appropriateness of any particular soil must depend in a degree on the relative conditions of climate and location. For instance, in a district having a heavy rainfall, and where the

land is low and flat, a soil of certain consistency would become over-saturated, while the same soil, if the land were sloping, the rainfall less heavy, might be sufficiently well drained. The qualities to be selected are a rich, mellow loam of lasting fertility, cool and moist, and at the same time well drained, containing a large amount of decayed vegetable matter, and preferably of volcanic origin.

THE PLANTATION.

The prospective planter must consider three things, the selection of a location, the preliminary work of establishment and organization, and the system and method by which the plantation is to be developed.

The location should be, if possible, in a district where abaca is already grown. This will be the surest way of determining that soil and climatic conditions are suitable, and will also guarantee a supply of suckers, or "seed," for starting the new plantation. The supply and quality of available labor, the condition of roads, and the facilities for water transportation; the supply of water, wood and building materials, and the distance from a market, are all matters that should receive consideration.

The site having been selected, the boundary line should be carefully located, and the plantation mapped out with a view to future development. At some central point, where there is a supply of good water, the necessary buildings may be erected. These will include a residence for the manager, a storage shed for tools and implements, and a shelter for animals. As soon as this preliminary work is finished the clearing and planting should be commenced.

The most difficult problem which the tropical planter has to face, and that which more than any other will determine his ultimate success or failure, is the manner in which he controls and directs his labor. To have available at all times as many workmen as can be used to advantage, and to so handle them as to secure the best results, requires a thorough knowledge of the native character and an infinite amount of tact and patience. When the plantation is first started arrangements should be made for building a native village of sufficient size to accommodate all natives needed in the plantation: together with their families. By this method the plantation manager will always have under his direct control a fairly reliable supply of labor; and if this system is properly carried out, the workmen will be more contented, better satisfied, and in every respect more easily handled than if secured in any other way.

HARVESTING.

The first stalks are ready for cutting at from twenty months to three years after planting. The time required for development varies considerably with different varieties and in different localities. After the first harvest it is customary to cut over a plantation about every eight months.

The abaca plant when mature consists of a group or cluster of from twelve to twenty stalks, all growing from one root. These stalks are in all ages of development, but usually two or three will mature and can be cut at about the same time. The stalk is ready for cutting between the time of the appearance of the flower and the development of the fruit. If cut either before or after this period an inferior quality of fibre will be obtained. When the plant is in flower the large violet colored flowered bracts fall to the ground, making it an easy matter when passing through the field to select the plants which are ready for cutting.

The stalk is cut with a bolo or knife having a sharp blade. The cutting should be made two or three inches from the ground and on a slant. If a perfectly horizontal cut is made water will collect on the stump causing it to rot and thus injuring the root and the remaining shoots. After the stalk has been cut the leaves are trimmed off and it is then ready for the first operation of fibre extraction.

EXTRACTION OF FIBRE.

The extraction of fibre should commence within twenty-four hours after the cutting of the stalk. If left a longer time than this the fibre is liable to become discolored and weakened. As the abaca trunk is heavy and the fibre extracting apparatus is light and easily transported, it is customary to move the latter from place to place and to extract the fibre near the spot where the plant is cut.

The trunk or stalk of abaca is often twelve

or fifteen feet long, and from one to one and one-half feet in diameter. This trunk consists of a small central fleshy stem, one or two inches in diameter, around which are a number of thick overlapping layers, each layer being the stem, or petiole, of a leaf. The fibre is obtained from the outer portion of these leaf stems. The process of fibre extraction consists of two distinct operations: First, the removal of the ribbon like strips of fibrous material from the leaf stems, and Second, the separation of the individual fibres by pulling these ribbons under a knife.

The laborer sitting on the ground with a trunk of abaca across his knees inserts under the bark of one of the leaf stems a small, sharp piece of bone called a "locnit," and pulls off a fibrous strip one to three inches wide and as long as the trunk. One stem will yield two or three such strips. When these fibrous strips have been taken off the remaining fleshy material is removed and each consecutive layer is thus worked down to the central stem of the trunk. The fibre obtained from the three or four outer layers, which are green and hard, will be coarse and dark colored, while that coming from the layers nearest the centre of the trunks will be very fine and white. The latter is not always stripped by the natives as it is too liable to break under the knife, but when extracted by this method is used only for the manufacture of various kinds of cloth. When a quantity of these fibre strips has been collected they are carried to some central point where a shed has been erected and an apparatus set up for stripping the fibre. The shed consists of a frame of bamboo poles covered with abaca leaves. The stripping apparatus, or "panguijan," is simple both in construction and operation. It consists of a log set in a horizontal position one or two feet from the ground. On the top of this is fastened a block of smooth hard wood. Over this block is placed a bolo having a blade about one foot long and a handle one and one-half feet long. A rattan is attached to the end of the knife and connected with a bamboo spring above. Another rattan passes from the handle to a foot treadle. The bamboo spring holds the knife down upon the block. Its pressure is easily regulated by lengthening or shortening the rattan. By means of the foot treadle the operator raises the knife when he desires to insert or remove a strip of fibre.

In the process of stripping the operator holds in his right hand one or more of the fibre ribbons and also a short round piece of wood. These strips are inserted under the knife and are drawn through with a quick, steady pull. The ribbon is then removed and reversed, the cleaned end being wound three or four times around the stick. This process of drawing under the knife removes all the pulp or fleshy material, leaving in the hands of the operator a small bunch of clean, wet fibre. As the fibre is stripped it is usually assorted into two classes. The work of fibre extraction, while apparently simple, is very exhausting, even for the experienced operator, and many laborers are ruptured by the excessive strain of pulling the fibre strips under the knife. It is a fair day's work to strip one arroba (25 pounds), and the fibre stripper will usually work only two or three days a week.

All the fibre produced in the islands is extracted with this simple apparatus. The color and strength of the fibre—two most important qualities—are determined almost entirely by the manner in which it is cleaned. The two factors in the process which affect the quality of the product, are the condition of the knife blade and the degree of pressure with which the knife is held upon the base block. With a serrated knife, loosely fastened, the fibres are only partially separated, and only a portion of the pulp is removed; the work is easy, the yield large, and the fibre is inferior in quality. With a knife having a smooth edged blade and held firmly on the base block the work of extraction is much more difficult and the waste is greater, but a very superior fibre may be obtained. It has been determined by experiment that the same plant will produce a very superior or a very inferior grade of fibre, depending on the kind of stripping knife used. As a result of using serrated knives the markets have been flooded with enormous quantities of inferior fibre, and cordage manufacturers are continually making complaint about the

quality of Manila hemp. The whole future of the industry, depending as it does on the position which abaca continues to hold in the world's markets, it is manifestly to the interest of every producer to discourage the use of the serrated knife.

The fibre extracting machine for abaca should be simple in construction, strong, cheap and portable. It must not break, tangle, discolor, waste, or in any way injure the fibre. The introduction of suitable machinery will do more than any other one thing to advance the interests of the abaca industry.

AFTER TREATMENT OF FIBRE.

Abaca, after being stripped, is hung on bamboo poles to dry. This drying takes from three to four hours to two days. When thoroughly dry the fibre is collected, tied up in hanks or bundles, and in this condition is shipped by ponies, carabaos, or cargadores, to the nearest market. It is there sold to a Chinese middleman or to the representative of some one of the large exporting firms of Manila. When the fibre reaches the warehouse of the exporter it is carefully sorted into the different commercial grades, and is then baled, each bale weighing 2 piculs or 275 pounds.

Fibre that is to be used locally for the manufacture of cloth undergoes much more elaborate process of treatment. The leaf stem in the centre of the stalk is selected and the fibre is often drawn several times under the stripping knife, which gives a product that is fine, soft and white. If to be used for the finest textures it is then placed in a wooden bowl and beaten with a mallet until the required fineness and elasticity are obtained. This process yields a fibre that is almost silk-like and some of the textiles manufactured from best quality abaca rival in delicacy and beauty the celebrated pina and jusi fabrics.

Exports of abaca from the islands during the fiscal year 1904 amounted to 129,742 tons, valued at $21,749,960, representing seventy-two per centum of the total exports from the Philippines during that period. Many new plantations are being developed, and present conditions and future prospects of the industry are very encouraging. In fact one of the first things that will be noticed in connection with this fibre industry is its rapid development in recent years despite the fact that the most primitive methods and implements are employed therein.

AN IMPROVED FEED FOR WOOLEN CARDS.

A feed for second breaker and finisher cards has recently been patented in this country and is shown in the accompanying illustration. It is said to increase the production of the card and also improve the quality of the work. The increase in quantity results from the accelerated speed which is possible with the feed mechanism, and the improvement in quality is brought about by working the lumps out of the web and getting the same into good condition—that is, making an even web of it—before delivery to the main cylinder. The inventor claims that a card can be run at least twenty-five per cent. faster with this feed mechanism than without it and will successfully handle a lower grade of stock for a given size of yarn.

Heretofore it has been necessary to run the second breaker and the finisher-card at a comparatively low rate of speed, and the web could not be worked down to the desired degree of evenness, but would be more or less lumpy and rough after passing through either machine, at least very much more uneven, it is claimed, than when this feed is used.

Fig. 1 is a side view of the feed as applied to the main cylinder of a finisher-card or second breaker.

The directions given to the teeth vary, as will be seen upon reference to the drawing, those on one member taking a different direction from those on an associated member, perhaps, the object being to arrange the teeth so as to handle the stock to the best advantage. The feed is so arranged as to leave considerable space between the tumbler and cylinder, for the former is not used to deliver the stock directly to the latter, as formerly. The arrows indicate the direction of movement for the tumbler, leader-in and other rolls.

A cylinder (j) termed "small" or "auxiliary" cylinder to distinguish it from the

main cylinder, is provided, also a doffer (k). The cylinder (j) operates in conjunction with the tumbler (d) and the doffer (k) in conjunction with the cylinder (j).

The first worker (n) is located in its usual position relative to the main cylinder, and the associated stripper (o) operates in conjunction with said worker, the doffer (k) and the main cylinder.

If desired or when found necessary, one or more workers (n′) may be arranged to operate in conjunction with the auxiliary cylinder and a corresponding number of strippers (o′). The workers (n′) may be a little smaller than the first worker (n) but revolve in the same direction.

The cylinder (j) delivers the web to the slow-running doffer (k) and from the latter the swift stripper (o) transfers it to the main cylinder. From this point on the web receives the usual treatment. By the time the web reaches the main cylinder the lumps have been worked out of it, and it is finer and more even, so that the resulting drawing or roving, as the case may be, will finally produce a better grade of yarn, the operation taking very much less time than formerly. The stripper (o) takes the web from the first worker (n) which has taken it from the cylinder (a) and returns it to the cylinder, as just described—that is, to reduce the stock quickly to proper condition before delivery to the main cylinder, because after such delivery there is no opportunity or provision for doing this work thoroughly and speedily.

The surface speed of the cylinders and rollers is indicated on the diagram by the number of inches per minute.

With very coarse stock and under some circumstances one or more strippers (o′) and workers (n′) may be used in conjunction with the auxiliary cylinder (j). Each stripper (o′) takes the web from the cylinder (j) and delivers it to the associated workers (n′) which returns the web to said cylinder, the object of this extra manipulation of the stock being the same as that of the general operation

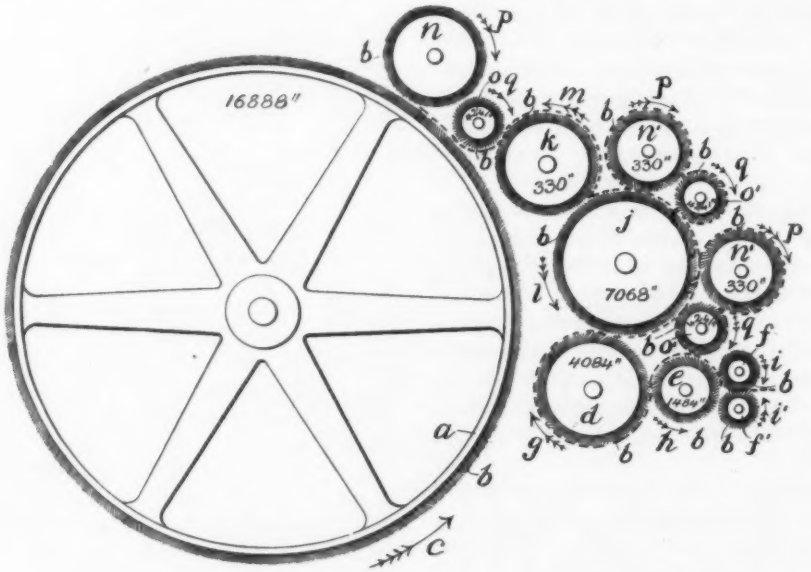


FIG. 1.

The value of the American cotton crop for the year 1903-04 is estimated by "Cotton Facts" at $614,000,000.

During the year 1904, 6,561,643 bales of cotton were exported from the United States valued at $368,839,188, an average price of 10 cents per pound.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE SCHOOL.

LESSON XV. POINTED TWILLS, POINTED WARP AND FILLING WAYS.

Having given in a former lesson of ours a most thorough explanation of drafting pointed twills warp ways, said lesson, as will be readily understood by the reader, will form the foundation for constructing pointed twills, pointed warp and filling ways, the pointing, or drafting to a point, being in this instance done in both directions of threads. The procedure is best explained by means of describing the construction of the few practical weaves given on the four plates of weaves accompanying this article and where

Weave Fig. A gives us the pointed twill (pointed warp and filling ways) obtained from the $\frac{1}{2}$ 3 harness 45° twill by drafting, both warp and filling ways, 3 ends left to right, to alternate with 3 ends right to left, and when (3+3=6—2=) 4×4 results in the repeat of the pointed twill obtained. This weave is also very extensively used as warp effect, and in which instance read □ = warp up, ■ = filling up.

Weave Fig. B has the same foundation weave as the previously given example of a pointed twill, with the difference that in the present example we draft alternately in both directions for 4 ends in place of three, hence repeat of the new weave (4+4=8—2=) 6×6.

Weave Fig. C shows the warp effect (its mate to) of the previously given weave, i. e.: ■ type in weave Fig. C equals □ type in weave

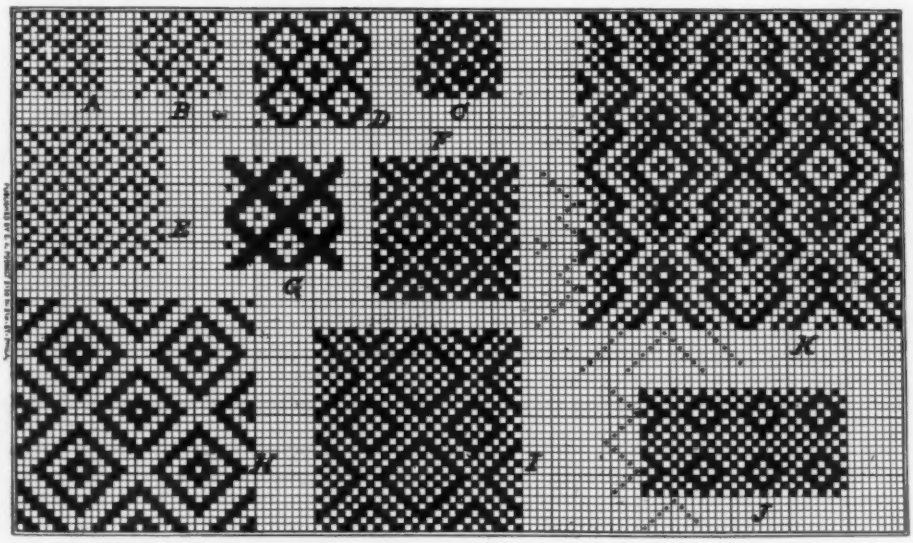


Fig. B, and □ type in weave Fig. C equals ■ type in weave Fig. B.

Weave Fig. D has for its foundation the $\frac{2}{2}$ 4 harness twill, drafted alternately for 5 ends one way, 5 ends the other way, both warp and filling ways. Repeat (5+5=10—2=) 8×8.

Weave Fig. E has for its foundation the $\frac{1}{2}$ 3 harness twill, drafted 6 ends one way and 6 ends reverse = (6+6=12—2=) 10×10, repeat of weave.

Weave Fig. F is the reverse (the warp effect) of weave Fig. E, or what is the same, the

pointed twill derived from the $_{1}{}^{2}$ 3 harness twill 6/6\.

Weave Fig. G has for its foundation the $^{2}{}_{2}$ 5 harness 45° twill, drafted for 5 ends from left to right and 5 ends from right to left. Repeat of weave (5+5=10—2=) 8×8. The single spot in the centre of this pointed twill is the result of one of the picks of said 5 harness foundation twill, viz.: pick reading $^{2}{}_{2}1$, the latter 1 being the spot (riser) seen in the centre of the filling effect. Drawing-in draft on 5 harness (lowest number possible to use) is thus: 1, 2, 3, 4, 5, 4, 3, 2.

Weave H is obtained from the $^{2}{}_{2}{}^{2}{}_{3}$ 9 harness 45° twill, by drafting 9 ends from left to right and 9 ends reverse. Repeat of weave (9+9=18—2=) 16×16.

Weave I has for its foundation the $^{2}{}_{1}{}^{1}{}_{1}{}^{1}{}_{1}$ 7 harness regular twill, from which is drafted 8/ and 8\. Repeat of weave (8+8=16—2=) 14×14.

Weave J has for its foundation the $^{2}{}_{1}{}^{1}{}_{1}$ 5 harness 45° twill, drafted 5/ and 5\; repeating on (5+5=10—2=) 8×8.

Weave Fig. K is the first example of a pointed twill given, in which the drafting warp ways differs from that used in filling ways, the arrangements observed being:

Warp Ways:

Draft 12 ends from left to right and
12 ends from right to left.

24 ends, repeat of drafting warp ways.

Filling Ways:

Draft 6 ends from left to right
3 ends from right to left
5 ends from left to right
5 ends from right to left
3 ends from left to right
6 ends from right to left

28 ends, repeat of drafting filling ways,

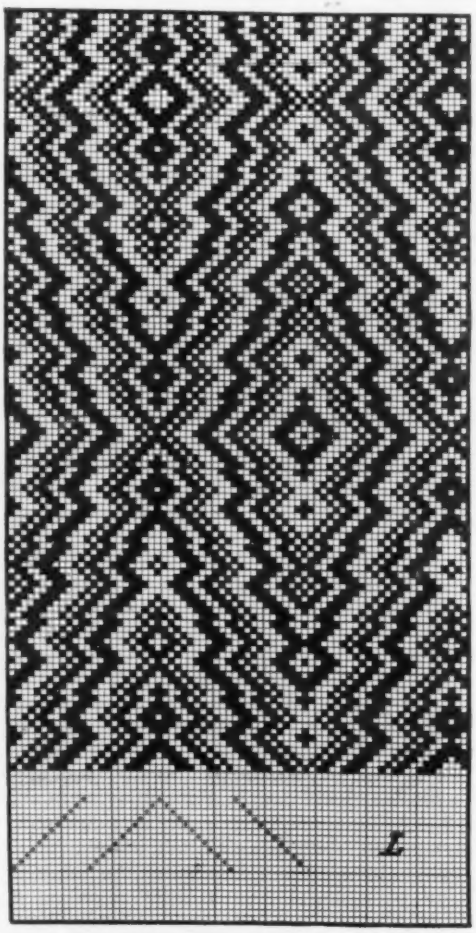
thus giving us repeat of weave: (24—2=) 22 warp threads × (28—6=) 22 picks, and which weave can be woven on 6 harness, using in this instance the warp drafting (see ⊡ type below weave) as drawing-in draft. ⊡ type on left hand side of weave illustrates the drafting filling ways as quoted before. The foundation weave for this design is the $^{2}{}_{2}{}^{1}{}_{1}$ 6 harness 45° twill. For harness chain use the first 6 warp threads and 22 picks of the design.

Weave L is another pointed twill, producing in turn what we might term a jacquard effect, to be produced on the harness loom; said weave or design having for its foundation the $^{1}{}_{1}{}^{2}{}_{2}{}^{3}{}_{3}$ 12 harness 45° twill.

Drafting Warp Ways:

24 ends from left to right and
24 ends from right to left

48 ends, repeat of drafting warp ways.



Drafting Filling Ways:

6 ends from left to right
4 ends from right to left
4 ends from left to right
2 ends from right to left
} =16 ends × 4 = 64 ends

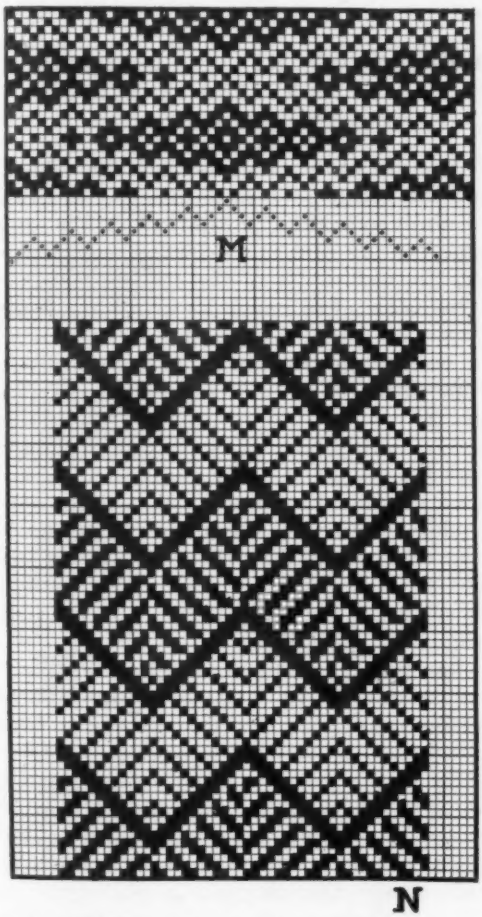
6 ends from left to right ..... = 6 ends
6 ends from right to left ..... = 6 ends

2 ends from left to right
4 ends from right to left
4 ends from left to right
6 ends from right to left
} =16 ends × 4 = 64 ends

Repeat of drafting filling ways: 140 ends

This will give us for the repeat of the new weave: (48—2=) 46 warp threads and (140—34=)106 picks; and which weave will require 12 harness for its practical work on the loom, as per draft given below the weave by ⊡ type. For harness chain use the first 12 warp threads and 106 picks of the design.

M shows another neat jacquard imitation effect, but in which instance the warp drafting is done "fancy" and the filling drafting "plain."



N

Foundation Weave: $\frac{2}{1}\frac{2}{2}\frac{1}{2}$ 10 harness twill.
Drafting Warp Ways:

4 ends from left to right
3 ends from right to left } 7 ends × 5 = 35 ends
4 ends from left to right ..... = 4 ends
4 ends from right to left ..... = 4 ends
3 ends from left to right
4 ends from right to left } 7 ends × 5 = 35 ends

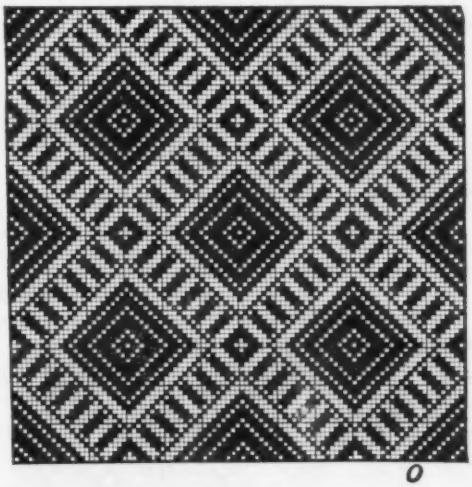
Repeat of drafting warp ways: 78 ends

Drafting Filling Ways:

9 ends from left to right
9 ends from right to left

18 ends, repeat of drafting filling ways.

The two arrangements of drafting thus quoted will result in a repeat of the new weave, thus: (78—22=) 56 warp threads and (18—2=) 16



O

picks; the design requiring for its execution in the loom 9 harness fancy draw as per ⊡ type below the design.

N shows us a combination of a pointed and broken twill effect design, repeating on 24×36. The pointed twill effect shows for its foundation the $\frac{1}{3}$ 4 harness twill for 15 picks deep, and the broken twill effect the $\frac{2}{2}$ 4 harness twill for 15 picks deep; both effects running—pointed—zig-zag across the width of the fabric, being separated from each other (in both instances) by means of a zig-zag band of warp threads up for 3 picks.

Weave O shows us a fancy pointed twill, pointed warp and filling ways, having for its foundation the 45×45 fancy twill weave given in detail in Fig. P. Weave O is obtained from said fancy 45° twill (P) by means of drafting—warp and filling ways—25 ends one way and 25 ends the other way; consequently repeat of weave O (25+25=50—2=) 48 warp threads × 48 picks.

It will be readily understood that from the variety of kinds of pointed twills thus given, the

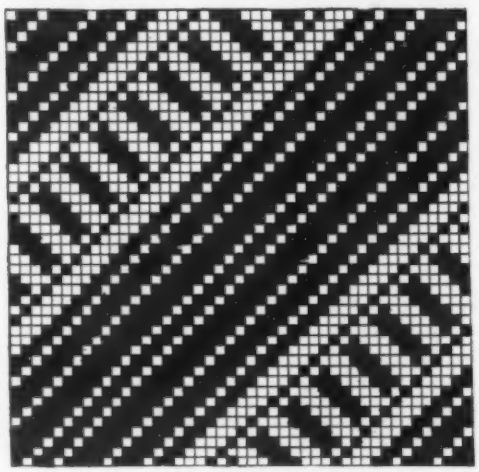
student will be enabled to produce novelties in this class of weaves whenever called upon; the amount of new weaves possible being "unlimited," and in turn will produce some of the best class of weaves met with in the cotton or silk industry.

LESSON:

Produce the following pointed twills, pointed warps and filling ways:

(1) Foundation weave $\frac{2}{3}$ 6 harness twill.
Warp and filling draft: 9 ends left to right
9 ends right to left
—
18 ends, repeat of drafting.
Repeat of weave, 16×16.

(2) Foundation weave $\frac{2}{2}\frac{1}{1}$ 6 harness twill.
Warp and filling drafting:
12 ends left to right
12 ends right to left
—
24 ends, repeat of drafting.
Repeat of weave, 22×22.



Produce also drawing-in draft for this weave for 6 harness and harness chain for 6×22.

(3) Foundation weave $\frac{3}{3}\frac{2}{2}\frac{1}{1}$ 12 harness 45° twill, draft warp and filling ways: 16 ends from left to right and 16 ends from right to left, resulting in a pointed twill repeating on 30×30.

(4) Foundation weave $\frac{2}{1}\frac{1}{1}$ 5 harness twill.
Draft warp and filling ways thus:
8 ends left to right
8 ends right to left
4 ends left to right
4 ends right to left
} and continue with this arrangement until repeat of new weave is obtained.

(5) Foundation weave $\frac{2}{3}\frac{1}{1}$ 6 harness twill.
Draft warp and filling ways:
7 ends left to right
3 ends right to left
} ×3
resulting in a new weave repeating on 24 warp threads × 24 picks.

(6) Foundation weave $\frac{4}{3}\frac{1}{1}\frac{2}{4}\frac{2}{1}\frac{1}{3}$ 20 harness 45° twill, to be drafted thus:
Warp Ways: 25 ends from left to right
25 ends from right to left
—
50 ends in repeat of drafting.
Filling Ways, draft thus:
8 ends from left to right
3 ends from right to left
} × 4
5 ends from left to right
5 ends from right to left
} only once
3 ends from left to right
8 ends from right to left
} × 4
Repeat of weave to be 48×80.

Make out proper drawing-in draft for 20 harness—as well as the harness chain necessary to produce design.

A METHOD OF TREATING COTTON SO AS TO GIVE INCREASED TENACITY TO THE STAPLE.

The gist of the process consists in subjecting the cotton to a heat sufficient to cause its fibres to curl up, or interlock, at the same time coating said fibres with carbon deposits. The chief use of the thus treated material is found in a superior article for filling pneumatic tires for bicycles and automobiles in order to protect them against punctures. Ripe cotton fibres, if examined by means of the microscope, will reveal their sections as hollow, nearly throughout the entire length, with the exception of the end which had not been attached to the seed; such fibres containing more or less water and vegetable oils with reference to their chemical composition. The accompanying illustration, Fig. 1, shows cross sections of ripe cotton fibres highly magnified.

The procedure observed in the new process consists in exposing these cotton fibres in the shape of a film to a degree of heat sufficient to convert the evaporative portions of the oil and water in the fibres into gases, which passing off will leave a carbon deposit or residue within the fibre and also on the outer surface of the same if water and oil were present thereon.

Fig. 2 shows a strip of film of raw cotton as required for the process, magnified. It will be seen from this illustration that the fibres by means of carding have been brought in a more substantially straight, i. e., parallel position. This cotton strip is then automatically held over a burning substance that is rich in carbon and at a distance there-

from (see Fig. 3), to be first only affected by the carbonic-acid gases. The heat will be sufficient to evaporate the moisture and thoroughly dry the cotton, and at the same time the carbonic-acid gases will carry sufficient carbon to thinly coat or discolor the cotton fibres. After keeping this strip of cotton in this elevated position for a few moments, to effect the results just described, it is then automatically dropped to a lower plane, or the burning material is elevated, as the case may be, and when the carbon then will be deposited more rapidly. The cotton is then moved from point to point until it can finally

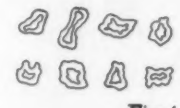


Fig. 1

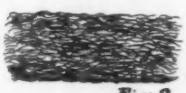


Fig. 2

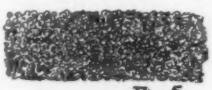


Fig. 5

Fig. 6

Fig. 3

Fig. 4

occupy a position (see Fig. 4) that is richest in carbon escaping from the point of combustion, and the carbon at this last point will of course deposit more rapidly. It may be mentioned here that if the cotton in the first instance had been placed at the lowest point (Fig. 4) the cotton would certainly ignite and burn up before sufficient carbon had been deposited to protect the fibres against the high temperature at this point, a feature which, however, has been prevented by means of gradually bringing the cotton at this point and that consequently the fibres are fully protected before they reach such lower position, and in turn will not ignite. The carbon deposits, as thus deposited on the fibres, will make them tougher and more tenacious; besides, the heat will cause the several hairy fibres to curl up, as shown in Fig. 5, and this curling of the fibres will then resemble more nearly wool.

As mentioned, the chief use of the thus prepared cotton is found as a filling for tires; Fig. 6 being a cross sectional view of a bicycle tire, showing the carbonaceous cotton utilized as an elastic non-punctureable filler for such an article. In the same letters of reference indicated thus: 1 represents a section of a pneumatic tire, having the lower air-chamber, 2, separated from an upper chamber containing the filling material by means of the flexible diaphragm, 3; 4 is the carbonaceous cotton filler placed in this upper chamber. This carbonaceous cotton is arranged in a continuous unbroken sheet and rolled up, as shown, filling said chamber and extending entirely round the tire. This carbonaceous cotton is not only tougher, and thereby harder to puncture, but its resiliency is also increased, however it may be placed in the tire—whether rolled, as shown, or deposited in layers.

It is also claimed for this prepared cotton that the same can with advantage be used in the manufacture of felts on account of the curled condition of the fibres, in turn, reducing the cost of felts.

COMBING.

II.

FULL LAP STOP MOTION.

As explained before, the spindle through the bobbin is held by curved projections on the top ends of the racks, which are in gear with spur gears on the same shaft with the brake pulley. Referring to the illustrations, a indicates the lap, and b is one of the vertical racks. On the rack b is placed a vertically movable piece c, which can be set for any size lap. As the lap is wound on, the bobbin increases in diameter and causes the rack b to rise, taking the piece c with it. When the bobbin is full, said piece c has risen so that it comes against the end of a horizontal rod d, and by overcoming

the resistance of the spring e, causes the other end of the rod d to press against the bottom arm of the bell crank lever f, centred at g, which gives an upward movement to the other arm of the lever. Directly above this arm is a catch arm h, which catches against the framing of the machine and prevents the spring i on the rod j from moving it in a horizontal direction. As the top arm

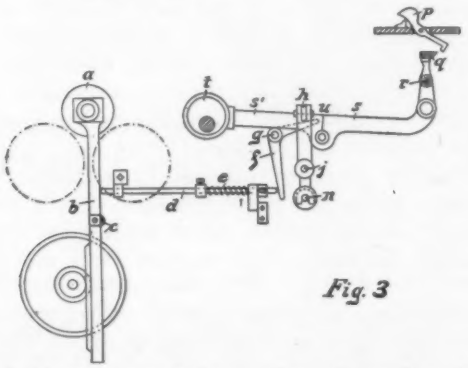


Fig. 3

of the bell crank lever rises, it pushes the catch arm h up out of contact with the framing and thus liberates the spring i. This spring, having been compressed by the dog k on the rod j and the bearing l when freed, will push the dog forcibly outward, carrying the rod j with it. On the left end of the rod j is fastened a short rod m which is also rigidly fized to the shipper rod n, so that when the top rod j is moved in an outward direction, the shipper rod is simultaneously moved in the same direction, which causes the belt fork o, that is attached to the shipper rod, to shift the belt from the fast to the loose pulley. In starting the machine, the belt is shifted on to the fast pulley, when the catch arm h falls in contact with the framing of the machine, and thus keeps the belt on the fast pulley.

SLIVER STOP MOTION.

This motion is also known as the spoon stop motion, because spoon shaped levers are employed. These spoons are pivoted at the centre, having their lower ends slightly heavier than their upper ends. Each sliver passes over a separate spoon p, and by its weight holds the lower end of the spoon up. directly under the lower ends of the spoons is an oscillating knife bar q, extending the full width of the machine, being centred at r and having its lower end connected to the double fulcrum arms s s'. This arm is moved back and forth by means of its connection with the eccentric t, which is driven positively through suitable gearing (not shown). This movement of the arm s s' gives the oscillating motion to the knife q, which can move freely when the lower end of the spoon is held up out of its path. All the parts of the stop motion are inoperative, while the spoon is held up, except the oscillating movement of the knife bar q. When a sliver breaks or leaves the spoon from any cause whatever, its lower end falls into the path of the oscillating knife bar q and engages it, thus preventing its movement. The continued movement of the eccentric t causes the double fulcrum lever s s' to break at the joint u, and the front half of the arm, s', goes upward by this movement and presses against the catch arm h, thus liberating it in the same manner as in the case of the full lap stop motion and stopping the machine as has been explained before. When the spoon is held up again the double fulcrum lever s s' regains its original position and the machine continues to run until another spoon drops down.

The setting of the draw rolls in a sliver lap machine are closely related to those for

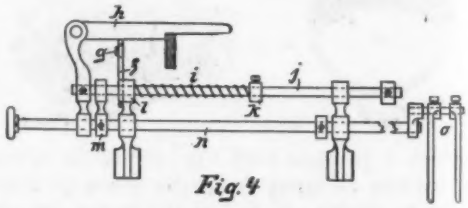


Fig. 4

the ribbon lap machine, and on account of the greater importance of the latter machine, will be dealt with under that head.

PRODUCTION.

The production of a sliver lap machine is best figured from the surface speed of the calender roll, the weight per yard of the lap and the time run. The usual speed to drive the pulley on a sliver lap machine is between 120 and 240 revolutions per minute.

Example:—Find the production of a machine for a day of 10 hours, allowing 10 per

cent. loss for stoppages, etc. The driving pulley to make 120 revolutions per minute and the weight per yard of the sliver being 250 grains.

The surface speed of the calender roll is obtained by figuring from the speed of the driving pulley.

$120 \times 29 \times 5'' \times 3.1416 \div 72 \times 36'' =$ 21.09 yards per minute.

Then

yards per minute $\times$ time run $\times$ weight per yard $\div$ 7000 (grains per pound) = pounds production per day.

$21.09 \times 540 \times 250 \div 7000 = 406.85$ pounds per day.

To find the number of spools filled per day per head:—Subtract the weight of the wooden spool from the weight of the full spool and divide that weight by the weight per yard of the lap. This gives the yards of lap on a spool. From the surface speed of the calender roll, and the time run, figure the total number of yards of lap produced. Then by dividing the number of yards produced by the number of yards on a spool, we get the total number of spools filled per day per head.

Example:—Find the number of spools filled for a day of 10 hours, allowing 10 per cent. loss for stoppages, etc., the driving pulley to make 150 revolutions per minute, the lap to weigh 240 grains per yard, the full spool to weigh 8 lbs., the empty spool weighing 2 lbs.

8 lbs. — 2 lbs. = 6 lbs. weight of lap on spool.

$6 \times 7000 \div 240 = 175$ yards on a full spool, and

$150 \times 29 \times 5'' \times 3.1416 \div 72 \times 36'' =$ 26.36 yards delivered per minute, and

$26.36 \times 540 = 14234.4$ yards delivered per day, and

14234.4 yards $\div$ 175 yards = 81.3 = 81 spools filled per day.

The amount of cotton that can be put on a spool depends upon the amount of friction on the spool and on the size desired.

The number of spools filled per day depends upon the speed of the machine, the weight per yard of the lap produced, the working time and the amount of friction on the spool.

RIBBON LAP MACHINE.

The cotton as coming from the sliver lap machine has simply been converted into a lap, so that it is in the desired shape for being worked on the ribbon lap machine, the object of which is to make a more uniform lap, ready for the combing process. This machine, like the draw frame, as will be explained later on, draws the fibres composing the lap more parallel, and makes the lap more uniform, in the same way that the draw-frame makes slivers more uniform. By this process of drawing the laps out, another advantage is secured in that it takes out the individuality of the slivers which compose the lap made on the sliver lap machine, and amalgamates the fibres so as to make a ribbon or narrow lap which is more uniform in thickness all across its width than is possible to be got from the sliver lap machine alone. A third advantage aimed at by the use of a ribbon lap machine is that by means of this process the nippers of the combers are able to get a more perfect grip on the fibres, a feature most beneficial to the satisfactory combing of the cotton.

The cotton is fed to the machine in the lap form and is taken from it in the same form, the only difference in the two being that the final lap is about an inch wider. This machine is as a rule composed of six heads (although eight may be used), each head being complete in itself, except the drive which is common to all; the production of all the heads being finally combined into one lap.

Six laps, one for each head, 7 1/2 inches wide, made on the sliver lap machine are placed on the wooden fluted lap rollers at the back of the ribbon lap machine, said rollers by means of frictional contact with the laps unwinding the same slowly. The lap is then taken forward by passing through the four pairs of drawing rollers. Between the wooden rollers and these drawing rollers the lap in its course through the machine passes over a balanced plate lever which serves the same purpose in the back stop motion of this machine as the spoon levers in the stop motion of the sliver lap machine previously ex-

plained. From the balanced plate lever, the lap is passed through guides which prevent it from spreading out, as is its natural tendency to do all through the machine. The total draft between the drawing rolls is about six. The cotton emerges from the rolls in the form of a fine sheet and from there passes over a curved web conductor, six of them, one for each head, being clearly shown in the perspective view of the machine given. The object of these curved conductors is to conduct the film of cotton, in its full width, from the delivery of the drawing rolls to the front table, which necessitates deflecting the cotton film 45 deg. The curve of the conductor is of such a shape that the tension over the entire width of the film is the same. As stated, the film passing over the curved conductor, goes on to the front table, which is simply a highly nickeled piece of iron, about 12" wide, extending the entire width of the machine, so that the sheets or films can readily pass along on it in their full width. As each sheet comes from its curved conductor on to the table, it passes through a pair of carrying rolls, and as the sheets pass along the table toward the winding mechanism, they become superposed on each other (each head delivering its film on the preceding one) and in this position pass forward, together, through the next pair of carrying rolls. The last pair of carrying rolls is near to and delivers to the winding motion which in turn winds the combined sheets upon a spool in the same manner as on the sliver lap machine. In order to secure laps of uniform length, a full lap stop motion is also provided on this machine, the mechanism being the same as that explained in connection with the sliver lap machine.

The superposing of the six webs one upon the other gives a very uniform section through the width of the lap, a feature which enables the comber nippers to hold the fibres more firmly, the result being a substantial reduction in the amount of waste made on the comber. This procedure of doubling the laps on the ribbon lap machine is similar to that employed at the feed end of a finisher scutcher, the chief difference being that the scutcher has a traveling lattice for passing the laps forward, while the ribbon lap machine has carrying rolls instead. Metallic rollers are strongly recommended for use in these machines, but if leather top rollers are used, they should have loose ends. The curved web conductors are in some instances of polished cast iron, but the tendency is to cover them with sheet brass, which is capable of taking a higher polish and thus enables the sheets to pass over them more easily. A disadvantage to the proper working of the machine is that on account of the films of cotton being so thin at the time they are passing over the curved conductors, said films are easily diverted from their proper course, and in turn make irregular laps. Another disadvantage to the machine is the breaking of the ribbons, due to several causes, among the most common being, laps licking at the drawing rolls, too much draft between the drawing rolls, too great a speed of the drawing rolls or the calender rolls, and the drawing rolls cutting the films of cotton. The machine has no stop motion between the back stop motion and full lap stop motion, previously referred to, consequently when a ribbon breaks in the machine, the same continues to run, in turn breaking down other ribbons, owing to the obstruction which the first broken ribbon makes, until the operator stops the machine. The partially filled spool has then to be removed and any part of the lap taken off, another empty spool placed in the machine, the partially filled spool afterwards being worked in the comber. The broken ribbons are then pieced up, and when the complete lap has come through the last pair of calender rolls, the waste thus made is removed and the lap guided on to the empty spool and the machine run at full speed. Although it is usual to run the six heads on the machine, yet in some cases only five are used, as in this instance a heavier sliver lap can be used with the same draft as with six heads. The ribbons from each head, in this instance, will be heavier and less liable to break in their passage to the lap winding motion, besides the ribbon which had to travel the greatest distance on the front table is the one cut out of the machine, hence reduces the liability of breakages. However, as stated before, the object of this machine

is to get the fibres in as parallel an order as possible for action upon the needles of the comber and which is better accomplished by the use of this machine than if a draw frame is used between the card and the sliver lap machine and such laps in turn subjected to the comber.

Rule for setting drawing rolls:—Set the centre of the front and centre of the second pairs of rolls one-eighth of an inch farther apart from each other than the length of the staple of cotton under operation, increasing this initial distance 1/8 inch for every succeeding pair of draw rolls. There are two combinations in the size of bottom rolls used viz.: First, having all the bottom rolls of a uniform diameter=1 1/2 inches. A disadvantage found in connection with this arrangement is the fact that the first and second pairs of rolls cannot be set close enough for short staple stock to produce satisfactory work. Second, using a smaller diameter, say 1 1/4 inches, for the second bottom roll, leaving the other rolls 1 1/2 inches diameter as before. This permits the setting of the second roll to be one-fourth of an inch closer to the first roll than would have been the case provided the first mentioned arrangement of using bottom rolls of a uniform diameter (1 1/2 inches) would have been used. This setting of the rolls in a ribbon lap machine is best explained by means of a practical example:—Suppose that a Sea Island cotton having a 1 7/8 inch staple is under operation. In this case set distance from centre of first to centre of second bottom roll, 2 inches; distance from centre of second to centre of third bottom roll, 2 1/8 inches, distance from centre of third to centre of last bottom roll, 2 1/4 inches. This increase of one-eighth of an inch between the bite of each pair of rolls is allowed for extra bulk. While rule given comprises a fair average setting, changes from it will often be made to suit the whim of an overseer, for instance one-sixteenth of an inch excess over the length of staple is sometimes used in place of one-eighth inch as mentioned before. However, as there is a constant tendency among cotton spinners, on account of production, to use as heavy a weight sliver as possible, it will be found that one-eighth of an inch in excess of the length of the staple between the front and second rolls, and gain one-eighth of an inch for each pair of rolls, as given rule, will not be too great a distance to produce satisfactory results. In setting the bottom rolls by the rule given, with brass gauges, when the second roll is 1 1/4 inches in diameter, there is no need to alter the gauge at all when spacing the third and last rolls after setting the second and third rolls, because the distance between the sides of the two rolls will be alike, that is, three-fourths of an inch. The top leather rolls are, when covered, slightly larger than the diameter of the bottom rolls, in order to help prevent channeling of the top rolls. If using metallic rolls, the same size of top roll is to be used as in the bottom rail.

(To be continued.)

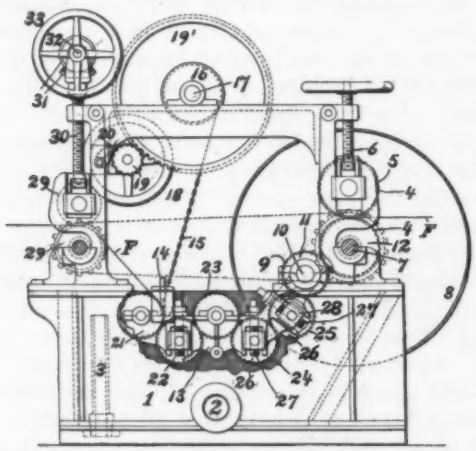
MODERN MERCERIZING.

Mercerizing has for its object to subject cotton yarn, warp or fabrics, in a stretched condition in a solution of caustic soda (the strength of bath being about 30° B.). The material is then removed from this bath and any surplus liquor extracted by squeezing the material through rolls previously to it leaving the tank containing the caustic soda bath. The material thus treated is then thoroughly washed with clear water, after which a second bath of dilute sulphuric acid neutralizes all remaining alkali, and a final rinsing of the material in clear water leaves it in a perfect condition for future treatment as the goods may require. It may be interesting here to mention that dilute solutions of caustic soda do not mercerize, it requiring the action of strong solutions to cause mercerization. The lustre to cotton obtained by mercerizing depends upon its quality, long stapled cotton giving the best results; again gassed yarns or fabrics will still further improve the lustre. Loose spun yarns will slip during the process, hence hard-twisted yarns are used in obtaining a perfect silky lustre, since then the twist will prevent many threads from escaping the tension. The more the lye-soaked cotton yarn or fabric is stretched during the process, the greater will be the lustre, and it might be well to mention here that the greatest lustre to a fibre is

obtained when the thread has reached its elastic limit. The silky lustre obtained on cotton by means of mercerizing is most durable and will resist bleaching, washing, dyeing, in the latter instance only thick precipitates on the fibre hiding it.

The cause of the lustre to the cotton fibre, by mercerizing, is found in that the cotton through the action of the caustic soda is brought to a gelatinous or parchment-like condition; the extreme tension rounding and concentrating the fibres so that the rays of light as they fall upon them are reflected instead of being absorbed.

As will be readily understood, the most important item for any cotton manufacturer, with reference to mercerizing, is the proper construction of the mercerizing machine to be used by him, since upon it the final result of yarns and fabrics (lustre) greatly depends, and for which reason we herewith will ex-



plain the construction and operation of one of the most prominent makes of this class of machine, i. e., the fabric mercerizing machine as built by the H. W. Butterworth & Sons Co., of Philadelphia.

The accompanying illustration is a side elevation of it, showing a portion of the tank torn away, in order to show some of the vital points of its interior mechanism. The machine in its more important points consists in a tank, 1, containing the mercerizing liquor (caustic alkali), and which tank is provided with outlets, 2, at its bottom for the purpose of either filling or drawing-off the tank, for mercerizing or washing; 3 represents an overflow pipe as fitted to the waste pipe or outlet, and whereby the contents of the vat may be permitted to run to waste or have its level limited to a certain height in the tank; 4 shows us a pair of squeeze rolls, geared together by means of their respective spur-gearing, 5; the upper one of these rolls being adjustable by means of screws, 6 (one on each side of the machine) in order to vary the pressure of the rolls onto the fabric, as circumstance may require. The lower roll of the set (4) is fitted upon the main shaft, 7, of the machine and which in turn is revolved by means of a pulley band, which in turn also acts as a fly wheel to the machine. As will be seen from the illustration, the two squeeze rolls thus referred to are located in such a position, at the end of the tank, that all liquor squeezed from the fabric in turn finds its way back again in tank 1. Arranged immediately in front of the lower roll, 4, is roller 9, the same being secured to shaft, 10, and geared to the main shaft, 7, of the machine by means of gearing, 11 and 12.

13 is a frame journaled upon shaft, 10, the same being free to move upward in the tank, 1, its downward movement being limited by latterly projecting arms, 14, coming in contact with the top of the vat, 1. This frame, 13, is raised or lowered by means of chains, 15, as are attached to drums, 16, carried upon shaft, 17, which is rotated by means of a hand wheel, 18, through gearing, 19, 19'. Pawl, 20, locks the gear, 19, and thus limits the position of the frame, 13, within the tank, 1, when not resting positively upon the arms, 14. By this adjustment the rollers carried by the frame, 13, may be immersed to various depths in the alkali solution so as to modify the degree of treatment (amount of lustre) to the fabric.

Journaled in the frame, 13, is a series of rollers, 21, 22, 23, 24, 25, geared together by means of spur-gears, 26, deriving their power from the main shaft, 7, through the intermediate gear, 11, on the roller, 9. The several rollers are arranged (as shown) in series, so that the fabric, F, passes over and under the rollers alternately in such a manner so as to be maintained in a stretched condition and subjected to a series of successive pres-

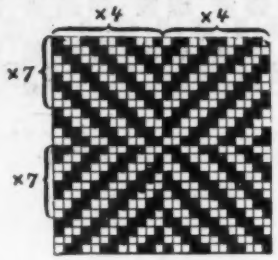
sures or squeezing actions in passing between the series of these rollers. Rollers, 22, 24, 25, are adjustable by means of screw, 27, in box, 28, and in which the rollers are journaled. By this means the distance and pressure between the rollers 21 and 22 and between the rollers 24 and 25 and also between the rollers 25 and 9 may be varied to suit the thickness of the fabric under operation.

29 are two tension rollers journaled in the front (entry) portion of the frame of the machine, pressure being applied to the upper roller by adjusting-screws, 30, bevel-gears, 31, shaft, 32, and hand-wheel, 33. Rollers, 29, grip the fabric and feed it regularly so that the pulling of the fabric (i. e., its tension) through the machine by the squeeze rollers, 4, and the remaining train of rollers described, will insure the fabric running in a very tight condition through the machine, free from all wrinkles or creases, in turn preventing any possibility of it shrinking laterally while under the action of the mercerizing bath.

After the fabric has thus been mercerized it is passed either to a washing machine, tentering machine, or subjected to any of the usual methods of treatment required for mercerized fabrics.

NOTELTIES FROM FOREIGN SOURCES

Woolen Cheviot Suiting.



Complete Weave. Repeat 96 × 12.

Warp: — 2270 ends, all 2 ply 5½ run twist woolen yarn, 8 harness fancy draw.

Reed: — 16 × 2 = 71 inches wide in loom.

Drees: —

2 ends, black and gray
1 end, olive and gray
1 end, black and gray
2 ends, olive and gray
2 ends, black and gray
1 end, olive and gray
1 end, black and gray
1 end, olive and gray
1 end, black and orange
} × 2 = 24 ends

1 end, black and gray
1 end, olive and gray
} × 3 = 6 ends

1 end, black and white = 1 end
1 end, olive and gray = 1 end
1 end, black and white = 1 end
1 end, red = 1 end
1 end, black and white = 1 end
1 end, black and orange = 1 end
1 end, black and white = 1 end
1 end, red = 1 end
1 end, black and white
1 end, olive and gray
} × 2 = 4 ends

1 end, black and gray
1 end, olive and gray
} × 2 = 4 ends

1 end, black and gray = 1 end
1 end, black and orange = 1 end
2 ends, black and gray
1 end, olive and gray
1 end, black and gray
2 ends, olive and gray
2 ends, black and gray
1 end, olive and gray
1 end, black and gray
1 end, olive and gray
1 end, black and orange
} × 2 = 24 ends

1 end, black and gray
1 end, olive and gray
} × 3 = 6 ends

1 end, black and white = 1 end
1 end, olive and gray = 1 end
1 end, black and white = 1 end
1 end, green = 1 end
1 end, black and white = 1 end
1 end, black and orange = 1 end
1 end, black and white = 1 end
1 end, green = 1 end
1 end, black and white
1 end, olive
} × 2 = 4 ends

1 end, black and gray
1 end, olive
} × 2 = 4 ends

1 end, black and gray = 1 end
1 end, black and orange = 1 end

Repeat of pattern: 96 ends

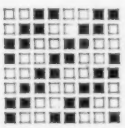
Filling: — 37 picks per inch, all 2 ply 5½ run twist woolen yarn or use 3 run single.

13 picks, black.
1 pick, rot.
3 picks, black.
1 pick, rot.
55 picks, black.
1 pick, green.
3 picks, black.
1 pick, green.
42 picks, black.

120 picks, Repeat of pattern.

Finish: — Worsted finish, 56 inches wide.

Worsted Melton Suiting.



Complete Weave.

Repeat 4×4.

Warp:—3805 ends, 12 or 16 harness straight draw.

Reed:—14×4=68 inches wide in loom.

Drees:—

2 ends, 2/36's worsted, black = 2 ends
1 end, 200/2's silk, white = 1 end
2 ends, 2/36's worsted, black = 2 ends
3 ends, single 36's worsted, black, twisted with 2/60's white mercerized cotton = 3 ends
2 ends, 2/36's worsted, black = 2 ends
1 end, 200/2's silk, white = 1 end
2 ends, 2/36's worsted, black = 2 ends
1 end, 2/36's worsted, gray and white
1 end, 2/36's worsted, black
} × 13 = 26 ends

3 ends, single 36's worsted, black, twisted with 2/60's white mercerized cotton = 3 ends
1 end, 2/36's worsted, black
1 end, 2/36's worsted, gray and white
} × 6 = 12 ends

1 end, 2/52's worsted, green and blue = 1 end
1 end, 2/36's worsted, gray and white
1 end, 2/36's worsted, black
} × 6 = 12 ends

3 ends, single 36's worsted, black, twisted with 2/60's white mercerized cotton = 3 ends
1 end, 2/36's worsted, black
1 end, 2/36's worsted, gray and white
} × 13 = 26 ends

Repeat of pattern: 96 ends

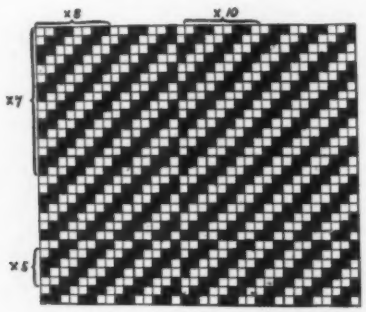
Filling :—62 picks per inch, arranged thus:

2 picks, 2/36's worsted, black ..... = 2 picks
1 pick, 200/2's white silk ..... = 1 pick
2 picks, 2/36's worsted, black ..... = 2 picks
3 picks, single 36's worsted, black, twisted with 2/60's white mercerized cotton ..... = 3 picks
2 picks, 2/36's worsted, black ..... = 2 picks
1 pick, 200/2's white silk ..... = 1 pick
2 picks, 2/36's worsted, black ..... = 2 picks
1 pick, 2/36's worsted, gray and white ..... × 16 = 32 picks
1 pick, 2/36's worsted, black .....
3 picks, single 36's worsted, black, twisted with 2/60's white mercerized cotton ..... = 3 picks
1 pick, 2/36's worsted, black ..... × 8 = 16 picks
1 pick, 2/52's worsted, gray and white .....
1 pick, 2/52's worsted, green and blue ..... = 1 pick
1 pick, 2/36's worsted, gray and white ..... × 8 = 16 picks
1 pick, 2/36's worsted, black .....
3 picks, single 36's worsted, black, twisted with 2/60's white mercerized cotton ..... = 3 picks
1 pick, 2/36's worsted, black ..... × 16 = 32 picks
1 pick, 2/36's worsted, gray and white .....

Repeat of pattern: 116 picks

Finish :—Melton finish, scour well, full slightly, clip on shear, finished width 56 inches.

Worsted Suiting.



Complete Weave. Repeat 158×142.

Warp :—3855 ends.

Reed :—15 × { 5 dents @ 4 ends; 1 dent @ 3 ends; 23 dents @ 4 ends; 1 dent @ 3 ends }

30 dents, 118 ends.

Dress :—

1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 3 = 6 ends
1 end, 2/40's worsted, dark gray .....
1 end, 2/40's worsted, black and light gray ..... × 6 = 12 ends
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 2 = 4 ends
1 end, 2/40's worsted, black and light gray ..... = 1 end
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 3 = 6 ends
1 end, 2/40's worsted, dark gray .....
1 end, 2/40's worsted, black and light gray ..... × 6 = 12 ends
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 2 = 4 ends
1 end, 2/32's worsted, blue ..... = 1 end
1 end, 2/40's worsted, black and light gray ..... = 1 end
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 3 = 6 ends
1 end, 2/40's worsted, dark gray .....
1 end, 2/40's worsted, black and light gray ..... × 6 = 12 ends
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 2 = 4 ends
1 end, 2/32's worsted, green ..... = 1 end
1 end, 2/40's worsted, black and light gray ..... = 1 end
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 3 = 6 ends
1 end, 2/40's worsted, dark gray .....
1 end, 2/40's worsted, black and light gray ..... × 6 = 12 ends
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 2 = 4 ends
1 end, 2/32's worsted, blue ..... = 1 end
1 end, 2/40's worsted, black and light gray ..... = 1 end
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 3 = 6 ends
1 end, 2/40's worsted, dark gray .....
1 end, 2/40's worsted, black and light gray ..... × 6 = 12 ends
1 end, 2/40's worsted, black .....
1 end, 2/40's worsted, black and light gray ..... × 2 = 4 ends
1 end, 2/40's worsted, black and light gray ..... = 1 end

Repeat of pattern: 118 ends

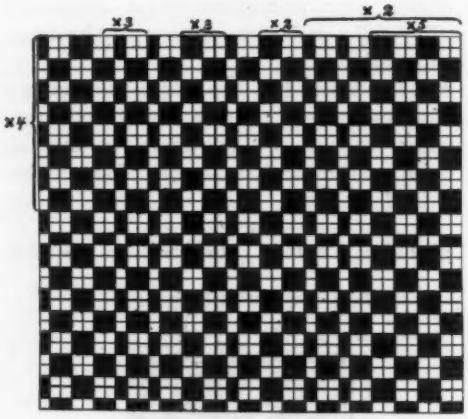
Filling :—64 picks per inch, arranged thus:

1 pick, 2/40's worsted, black .....
1 pick, 2/40's worsted, black and light gray ..... × 3 = 6 picks
1 pick, 2/40's worsted, dark gray .....
1 pick, 2/40's worsted, black and light gray ..... × 6 = 12 picks
1 pick, 2/40's worsted, black .....
1 pick, 2/40's worsted, black and light gray ..... × 2 = 4 picks
1 pick, 2/40's worsted, black and light gray ..... = 1 pick
1 pick, 2/40's worsted, black .....
1 pick, 2/40's worsted, black and light gray ..... × 3 = 6 picks
1 pick, 2/40's worsted, dark gray .....
1 pick, 2/40's worsted, black and light gray ..... × 6 = 12
1 pick, 2/40's worsted, black .....
1 pick, 2/40's worsted, black and light gray ..... × 6 = 12 × 4 = 96 picks
1 pick, 2/40's worsted, dark gray .....
1 pick, 2/40's worsted, black and light gray ..... × 6 = 12 picks
1 pick, 2/40's worsted, dark gray .....
1 pick, 2/40's worsted, black and light gray ..... × 2 = 4 picks
1 pick, 2/40's worsted, black and light gray ..... = 1 pick

Repeat of pattern: 142 picks

Finish :—Worsted finish, 56 inches wide.

Worsted Suiting.



Complete Weave. Repeat 136×82.

Warp :—3615 ends, 8 harness fancy draw.

Reed :—14½ × { 2 dents @ 3 ends; 3 dents @ 4 ends; 1 dent @ 3 ends; 3 dents @ 4 ends; 1 dent @ 3 ends; 2 dents @ 4 ends; 2 dents @ 3 ends; 10 dents @ 4 ends; 2 dents @ 3 ends; 10 dents @ 4 ends }

36 dents, 136 ends=one repeat of pattern.

Dress :—

1 end, 2/28's worsted, dark gray ..... = 1 end
2 ends, 3/52's worsted, fancy, white and drab ..... = 2 ends
2 ends, 3/52's worsted, slate, white and slate ..... = 2 ends
1 end, 2/36's worsted, pearl ..... = 1 end
2 ends, 3/52's worsted, slate, white and slate .....
2 ends, 3/52's worsted, fancy, white and drab ... × 3 = 12 ends
1 end, 2/56's worsted, green, and 2/56's worsted, yellow, twisted ..... = 1 end
2 ends, 3/52's worsted, fancy, white and drab .....
2 ends, 3/52's worsted, slate, white and slate ... × 3 = 12 ends

2 ends, 3/52's worsted, fancy, white and drab .....= 2 ends
1 end, 2/56's worsted, green, and 2/56's worsted, yellow, twisted.....= 1 end
2 ends, 3/52's worsted, fancy, white and drab.... } × 2= 8 ends
2 ends, 3/52's worsted, slate, white and slate .... }
2 ends, 3/52's worsted, fancy, white and drab .....= 2 ends
1 end, 2/28's worsted, dark gray.....= 1
2 ends, 3/52's worsted, fancy, white and drab= 2
2 ends, 3/52's worsted, slate, white and slate= 2
1 end, 2/28's worsted, pearl.. .....= 1 } × 2= 92 ends
2 ends, 3/52's worsted, slate, white and slate..... } ×10=40
2 ends, 3/52's worsted, fancy, white and drab..... }

Repeat of pattern: 136 ends

Filling:—62 picks per inch, arranged thus:

1 pick, 2/56's worsted, green, and 2/56's worsted, yellow, twisted.....= 1 pick
2 picks, 3/52's worsted, fancy, white and drab... } × 3= 12 picks
2 picks, 3/52's worsted, slate, white and slate ... }
2 picks, 3/52's worsted, fancy, white and drab.....= 2 picks
1 pick, 2/56's worsted, green, and 2/56's worsted, yellow, twisted.....= 1 pick
2 picks, 3/52's worsted, fancy, white and drab... } × 16= 64 picks
2 picks, 3/52's worsted, slate, white and slate ... }
2 picks, 3/52's worsted, fancy, white and drab.....= 2 picks

Repeat of pattern: 82 picks

Finish:—Worsted finish, 56 inches wide.

Worsted Suiting.

Complete Weave.

Repeat 2×2.

Warp:—2750 ends, 8 harness straight draw, all 2/36's worsted.

Reed:—21×2=65 inches wide in loom.

Dress:—

1 end, black.....= 1 end
1 end, dark and medium gray.....= 1 end
1 end, black.....= 1 end
2 ends, medium and light gray..... } × 2= 6 } × 3= 24 ends
1 end, dark and light gray ..... }
2 ends, dark and medium gray... .....= 2 }
2 ends, medium and light gray ....= 2 ends
1 end, dark and light gray .....= 1 end
2 ends, medium and light gray .....= 2 ends
1 end, black and orange.....= 1 end
1 end, dark and medium gray .....= 1 end
1 end, black and orange.....= 1 end
6 ends, medium gray and light gray.....= 6 ends
6 ends, dark gray and medium gray .....= 6 ends
6 ends, medium gray and light gray... .....= 6 ends
1 end, black.....= 1 end
5 ends, dark and medium gray.....= 5 ends
6 ends, medium gray and light gray.... .....= 6 ends
3 ends, dark and medium gray.....= 3 ends
1 end, black and orange.....= 1 end
1 end, dark and medium gray.....= 1 end
1 end, black and orange.....= 1 end
2 ends, medium gray and light gray .. } × 2= 6 } × 3= 24 ends
1 end, dark and medium gray..... }
2 ends, dark and medium gray..... = 2 }
2 ends, medium gray and light gray ....= 2 ends
1 end dark and medium gray.....= 1 end
2 ends, medium gray and light gray.....= 2 ends

Repeat of pattern: 100 ends

Filling:—44 picks per inch, all 2/36's worsted, arranged thus:

2 picks, brown and pearl..... } × 2= 6 } × 4= 32 picks
1 pick, brown and drab ..... }
2 picks, brown and drab..... = 2 }
2 picks, brown and pearl ..... } × 2= 6 picks
1 pick, brown and drab..... }
1 pick, brown and drab.... .....= 1 pick
1 pick, brown.....= 1 pick
2 picks, brown and pearl ..... } × 2= 6 } × 3= 24 picks
1 pick, brown and drab..... }
2 picks, brown and drab..... = 2 }
2 picks, brown and pearl .....= 2 picks
1 pick, brown and drab... .....= 1 pick
2 picks, brown and pearl ....= 2 picks
1 pick, black and orange .....= 1 pick
1 pick, brown and drab..... .....= 1 pick
1 pick, black and orange.....= 1 pick

6 picks, brown and pearl..... ....= 6 picks
6 picks, brown and drab.....= 6 picks
6 picks, brown and pearl .....= 6 picks
5 picks, brown and drab.....= 5 picks
1 pick, brown.....= 1 pick
6 picks, brown and pearl .....= 6 picks
6 picks, brown and drab.....= 6 picks
6 picks, brown and pearl.....= 6 picks
3 picks, brown and drab.....= 3 picks
1 pick, black and orange .....= 1 pick
1 pick, brown and drab .....= 1 pick
1 pick, black and orange .....= 1 pick

Repeat of pattern: 120 picks

Finish:—Worsted finish, 56 inches wide.

THE WASHING OF WOOLEN AND WORSTED GOODS.

This process, as a rule, follows fulling, and has for its object to thoroughly clean the fabric of all the impurities adhering to the structure. However, there are instances in which the flannel is washed or scoured previous to fulling, either for special reasons or the fact that some finishers prefer such a procedure, claiming in this way more satisfaction with reference to production, as well as final finish. Again washing of the goods is also done in connection with piece dyes after dyeing, the same when goods are speck or burr dyed, or after carbonizing, etc.; however, in any of these cases the washing then is more or less a rinsing off (possibly using in connection with it fuller's earth or a mild scouring liquor or soap) for the fact that these goods originally had been once thoroughly washed or scoured previous to dyeing. In the present instance we refer to washing goods, as is practiced after fulling.

Closely examined, the washing of fulled cloth may be divided into two parts—the solution and loosening of the fulling filth, consisting principally of oil, soap, color residues and glue; and next, rinsing it away with either cold or warm water. These operations are sometimes performed separately, as many fullers first loosen the dirt in the fabric when the latter is still in the fulling mill, that is, after the fulling operation has ended, and then wash the cloth in the washing machine. They urge, as a reason for this procedure, that the dirt will come off better from the cloth still warm from fulling, than after it has been transferred to the washer, and possibly more or less laid around for a time. However, in most cases the goods, after fulling has been finished in the mill, are washed

in the washing machine or washer as the latter is called, and it must be remembered that the sooner the goods, as coming from the mill, are washed, more particularly during warm weather, the easier and at the same time more thorough the process will be done. Whenever possible, never let the goods lay in a heap over night before scouring; try and enter them in the washer anyway, even if only for a few runs so as to cool them.

When the proper soap has been used at the fulling, and such soap retained its vitality to the end of the process and more, then there is no question but that the scouring of the goods is an easy process, in fact only a rinsing, especially if able to use lukewarm water. However, if the soap as used for fulling had lost vitality before the process finished, or just at this point, the soap being of too light a body, then in this instance a scouring soap or liquor has to be used at the washing in order to get the goods clean.

SCOURING LIQUOR.

It is not necessary that the body of this liquor be heavy; quite the reverse, it is better to keep it light, and for which reason about one to one and one-half ounces of soap to the gallon water is sufficient. Again cheaper grades of soap may be used, for the fact that it is upon the strength of the liquor that reliance has to be placed, and for which reason the amount of alkali should be somewhat larger than what is used in a fulling soap. The strength of the liquor, however, depends entirely upon the character and the condition of the goods. For example, if dealing with colors not fast to fulling, then it will not do to use too much alkali or else they may be injured. When the proper amount of ingredients have been well combined by boiling, the tank is filled up with water and left to cool. Just before the soap becomes cold, you may add to the mixture about one ounce of sal ammonia to the gallon, but if the alkali is ammoniated, one-half ounce will do. Stir frequently until well mixed.

Several pailfuls of this scouring liquor are given the goods, provided the lather does not show up good, i. e., the fulling soap has lost its vitality at the fulling, and after giving them 20 to 25 minutes in this, it is drawn off and the procedure repeated, and after that the goods are thoroughly rinsed. The same proceeding is applicable to goods that are washed before fulling.

Another good scouring liquor is made by adding about two ounces of pearl ash to each gallon of water the tank will hold. This mixture does not need boiling since the pearl ash will readily dissolve. In connection with this liquor, use your regular fulling soap for scouring purposes. Wyandotte textile soda is also a most excellent article to use in connection with soap for scouring purposes, especially on account of its mild action on fibres and colors. On worsteds requiring no fulling, this scouring liquor made with pearl ash or Wyandotte textile soda will be found to give excellent results.

WATER.

Another important item for perfect washing is the kind of water to be used. The best to use is warm water, but unless this is plentiful at hand, cold water will have to do; however, there is nothing which will have as beneficial an effect upon the goods at the washing as a sufficient supply of lukewarm water. To always have an even temperature for the water is another item of importance. The temperature for the water should not exceed 110° F. After the washer is started, turn on the warm water and fill its trough about half full, having previously closed all the gates, and let the goods then run in this water for about 20 minutes, and when there will be ample evidence of the vitality of the fulling soap used, for if it is right, the washer will be filled to overflowing with a thick, rich and creamy lather, although dirty, for it is tainted with all the impurities of the goods which have become loosened and entered into the lather by the use of the warm water. If the goods show such a lather, no scouring liquor will be required to be used for washing the goods, the procedure of scouring simply dissolving itself in a procedure of rinsing by drawing off the sud at the end of 20 minutes, and entering another supply of warm water, and allow the goods to run in this again 20 minutes. At this second scouring, the lather should show up white, and still be thick and creamy. When in turn this second sud is drawn off and the washer is about half empty, turn on the warm water

and rinse the goods with it as long as the supply will last, and then turn on the cold water and rinse till all traces of the soap are gone. The time for this depends upon the supply of warm water at command and upon the nature of the fulling soap which had been used. With an unlimited supply of warm water at hand, rinse the goods about half an hour and follow this with about half an hour in cold water, and when, as a rule, the soap will be found to be well out of the fabrics. Keep in mind that warm water will remove the soap faster than cold water, and that if no warm water is on hand, the process will take so much longer. When using cold water entirely, it will be advisable to give the goods at the second water about a pint of diluted ammonia to each piece, which will help to loosen the soap and thus aid in its removal.

If, however, at the first water the lather does not show itself to any extent, and the suds look thin, instead of thick and creamy, it is a sign that the vitality of the fulling soap is gone, and for which reason a thorough washing must be at once given the goods, by drawing off this first water and giving each of the pieces several pails of a strong scouring liquor.

AMMONIA.

The action of the ammonia as an alkali for neutralizing fatty acids is strong. It saponifies fatty acids much better than potash and soda, and only its volatility makes it less suited for the manufacture of hard soaps for textile and other purposes. But then it is largely used as an agent for expediting the combination of other alkalies with the fats. This also explains its capability of increasing the action of other alkalies in washing, as well as that of soap. If ammonia is poured on cloth charged with soap, at the beginning of the scouring process, an essentially greater quantity of foam will be formed, the fulling filth will rise better and quicker, and the cloth is cleaned more perfectly.

Ammonia is not only more effective for the raising of the filth, but it also expedites the rinsing off of the soap, a feature of the greatest importance in connection with goods to be dyed. As is well known, traces of soap will remain in the goods in spite of slow and careful rinsing. Such residues are for piece dyeing, just as those of oil or fat; but when ammonia is added before the final completion of the washing process, and an emulsion formed of it, then any residues left are almost entirely neutralized.

The ammonia is to be used diluted with from double to quadruple its volume of clean, cold water; adding one-half of this quantity at once at the beginning of the washing to expedite the dissolving of the fulling filth, and the other half only when the worst filth and foam have been rinsed away, so that the escaping water is of the appearance of clean soap water; a strong emulsion will then be formed again, which contributes essentially to the expulsion of the last traces of soap.

It is also of advantage to add a little ammonia to the fuller's earth, provided such is used for the final rinsing of the goods.

Ammonia may be used without fear for any tender shades, if a certain degree of care and a sufficient state of dilution are used. However, there are several colors, the tones of which are slightly altered by ammonia—for instance, nearly all the reds, principally those of brazil wood, madder, or cochineal. In doubtful cases the dyer can furnish the best information as to how far the use of ammonia is permissible for a certain shade. All the colors with some pretence to fastness—logwood black, alizarin black, indigo blue, alizarin blue, green and brown, also all the fashionable colors fast to fulling—may without fear be exposed to the influence of ammonia in washing, that is, provided if, as mentioned before, care and a sufficient diluted article is used.

It is not at all true that ammonia injures the feel of the goods, as is asserted; sometimes, however, the use of ammonia requires the observance of one condition, and which is that goods treated with ammonia must not be placed in contact with metallic parts, at least not immediately after ammonia is poured on, since this contact will cause spots which are most injurious, especially for cloth intended for piece dyeing. Cuprous ammonia is formed instantaneously if such cloth touches copper or brass. The spots thereby are hardly noticeable in white or pale ground

cloth, and only when held against the light do they appear as if colored feebly brown, but after dyeing these spots are strongly pronounced and much darker, as cuprous ammonia makes the fibre more sensitive to the dye. The spots will appear almost black in indigo dyed cloth, and for which reason copper or brass bottoms or rollers must never be used in washing machines. For the same reason ammonia should never be used in fulling mills the lower cylinder of which has a brass rim, etc., etc.

FULLER'S EARTH.

The softening and cleansing properties of this earth are appreciated by all finishers who have come in contact with it, especially the refined product, and which is much to be preferred to the crude article, and like any other article, in the end will be the cheapest; since the former will better combine with water, and the residue will not be as great. Do not attempt to use more of the earth than the water will hold in suspension without frequent stirring, since too much fuller's earth is worse than not enough. A good plan is to use to one barrel full of water, two pailfuls of the earth; using more will give unsatisfactory results. The proper time to use fuller's earth is any time after the goods are washed, i. e., fulling filth rinsed off.

If washing goods which had been burr-dyed, a bath of the earth after rinsing will help much to prevent crocking, since the crocking of goods is always more or less due to insufficient rinsing after the goods have been burr-dyed.

With reference to the machines for thus scouring the goods, there are two types, viz: one where the pieces are dealt with, more or less, in a rope form, and several pieces or strings at one time, and the other where the pieces are dealt with in the open width.

THE ROPE WASHER

consists of a more or less semi-cylindrical trough for holding the water, the scouring liquor, and in which the goods are made to travel, each piece in one continuous string. Above this are two heavy wooden rolls, one on top of the other, and in order to still more increase the pressure, the top roll is supplied with elliptic springs, fastened by means of iron rods, outside, to the framing of the machine. Outside of the machine these two rolls are geared to each other by means of very long toothed gears, which make the drafts uniform and prevent much damage. Rope scouring machines come in different widths, intended for either 4, 6 or 8 pieces to be washed at one time, and being known for this reason respectively as four, six or eight string washers, for the fact that each piece, after having its selvages sewn together, forms one continuous string. In some instances, however, two or three pieces are sewn together to thus form one string. The strings of cloth, during the operation of washing, pass through guide rings and pins and between the two heavy wooden rolls, B C, previously referred to, passing in turn over a small prominently grooved roll, H, set with its shaft considerably above the shaft of the top roll, C, and which takes the strings of cloth from the two heavy wooden rolls, and allows them to run again to the bottom of the trough. If it were not for this roller, the goods would be liable to stick to either of the two large wooden rolls and be taken around with them, and thus bring things speedily to a snarl. This small back roller, therefore, must be watched to see that it works properly, in order to prevent possible damage to the goods. Below the lower wash roll there is placed in the machine a box, H, known as the suds box, arranged with an outlet on the side of the machine, and several openings in its bottom. A slide is so arranged that if it closes the outlet at the side, it opens the ones in the bottom of the box, and vice versa. By this arrangement the suds squeezed out of the goods by the two heavy wooden rolls pass through the openings at the bottom of the suds box again on to the goods, but when the time comes to draw off the suds, the slide is pushed in to cover the openings in the bottom and open the one on the side, and the suds squeezed out of the goods at once pass off, and do not again drop on the goods. When the washing has been properly effected, the goods are taken out of the washer, hydro-extracted, and when they are ready for the next process of finishing, as regulated by the character of

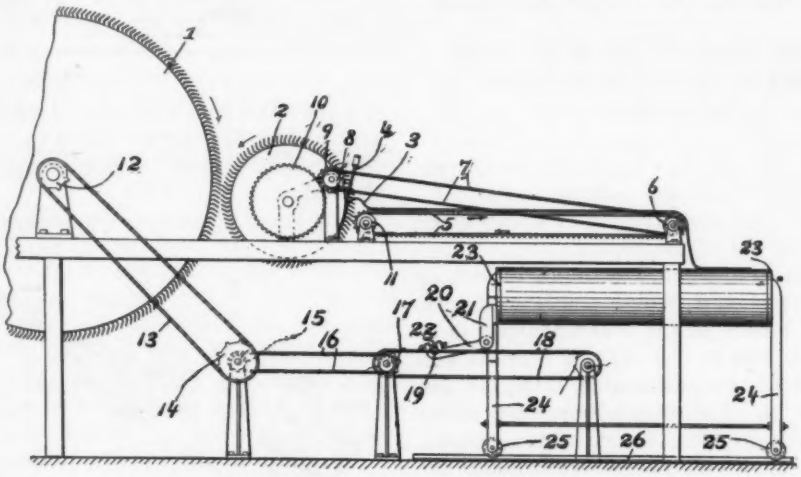
the fabric under operation, they have to undergo.

SCOURING IN THE OPEN WIDTH.

The pieces scoured in such a rope washer are certainly always more or less folded up, and are liable to contract creases, which, with fine goods, is undesirable; to avoid these creases and crimps, the pieces must be treated in a washing machine, where they can be dealt with while full width or open. In general, these machines differ but little from the rope washer, previously explained, only they are made somewhat narrower, and only take one width of cloth at a time. Several pieces are stitched together, end to end, so as to make one long length, so as to keep the fabrics for a longer time in the wash water or scouring liquor, than if using one piece at one time, otherwise the manipulations are the same with each kind of machine.

BAT FORMING AND DELIVERING DEVICE FOR CARDS.

The object of this device, the invention of E. Tyden, is to:



First: Provide in a carding-machine improved means for carrying the film from the doffer onto the blamire, and

Second: Improved means for operating the blamire in its reciprocating movement.

In order to be able to more clearly explain the contrivances provided for obtaining these two objects mentioned, the accompanying illustration is given, the same being a side elevation of the delivery end portion of a carding engine, having the new contrivances added.

In the operation of the carding engine, the film of fibre, carded by means of suitable located workers and strippers (not shown) as working in connection with the main cylinder, 1, of the card, in turn is delivered from the latter onto the doffer cylinder, 2, by reason of the greater surface speed of the main cylinder, in connection with the opposite direction of rotation of both cylinders. From the doffer cylinder, said film, 3, in turn is stripped in the usual manner by the doffer comb, 4, and delivered onto the upper ply of the endless carrier apron, 5, as driven by a roller, 6, which derives motion through a chain, 7, from a sprocket-wheel, 8, the shaft of which has a gear, 9, meshing with a gear, 10, as is fast on the shaft of the doffer, 2. Apron, 5, at the inner end of its course passes about idle roller, 11.

THE OPERATING OF BLAMIRE FEED

is done from a sprocket-wheel, 12, fast on the main shaft of the carding engine by means of a sprocket-chain, 13, driving another sprocket-wheel, 14, situated on a shaft carrying also a double set of sprocket-wheels, 15 (only one can be shown), each operating in turn another sprocket chain, 16, another sprocket wheel, 17, and the latter, each finally another sprocket chain, 18.

The set of chains, 18 (only one can be

shown), are connected by a rod, 19, mounted on corresponding links of the two chains, a pitman rod, 20, being detachably pivoted at one end on the rod, 19, being at the other end pivotally connected with lugs, 21, on the blamire frame.

For the purpose of a detachable connection of the pitman, 20, with the rod, 19, the link for striding the rod is transversally notched and a cotter-pin, 22, employed to retain it on the rod, so that by withdrawing the cotter-pin it may be disconnected for any movement of the blamire frame. The latter comprises the bars, 23, in which are journaled the rolls, about which the blamire-apron is carried. 24 are standards, carrying supporting wheels, 25, to run on tracks, 26, as are secured to the floor.

By means of connections and devices thus described, it will be seen that the blamire carriage is actuated by engagement from one connection, situated midway between its tracks, in turn preventing any chance of cramping it in its travel on the tracks, the draft of the connecting element on the link of the chain to which it is connected not cramping the chain on the sprocket-wheel.

A NOVEL CONSTRUCTION OF YARN CONTROLLERS FOR SPINNING MACHINES.

The novelty of the new device, the invention of John O'Sullivan, consists

1st in the new construction of a yarn guide and its mode of adjustment;

2d in the controlling, i. e., mode of locking of the thread board; both items being clearly shown by means of the accompanying illustrations, of which Fig. 1 is a vertical sectional view of the new device, taken on line x x of Fig. 2, which is a bottom view of the thread guide in place on the thread board. Fig. 3 is a detail view of the thread guide, the parts being shown separated, so as to more clearly show its construction.

In said illustrations 1 designates the yarn guide, 2 the thread board, and 3 the board to which the latter is hinged, by means of hinges 4. 5 are adjustable brackets for supporting the thread board, 2, in position. As readily seen from illustration, Fig. 1, the shank, 6, of the yarn guide, 1, is frictionally held between two plates, 7 and 8, the latter being the base plate, of relatively heavy structure, and the former a smooth nickel plated means constituting one leaf of a hinge

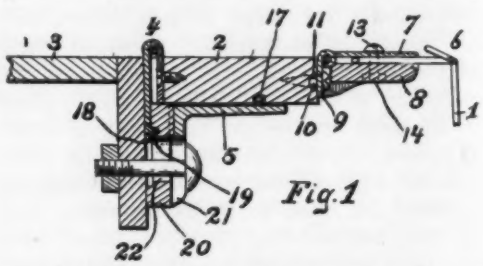


Fig. 1

by which the yarn guide is connected to the thread board. The other leaf, 9, of said hinge is flanged at its lower edge, as at 10, and which flange sits in a groove, 11, formed in the front edge of the thread board. Portion

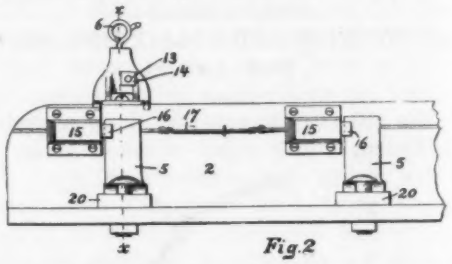


Fig. 2

9 is provided with a hole for inserting a screw tapped into the thread board to thus secure the thread guide supporter in position desired.

The lower plate, 8, is chambered out, as at

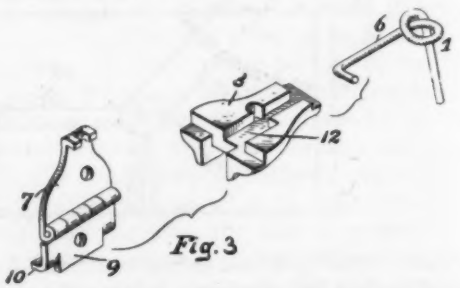


Fig. 3

12 (see Fig. 3) to thus permit the shank of the thread guide to be shifted, and any desired position of the guide eye obtained, after which the yarn guide is secured firmly in such place by clamping the two plates, 7 and 8, together through the medium of the screw,

13, and the nut, 14, into which it is tapped (see Fig. 1).

The means for holding the thread board down consist of a housing, 15, secured to the under side of the thread board, 2, and inclosing a spring pressed bolt, 16, which catches over the horizontal part of the bracket, 17, and has attached to it a wire, 17 (resting in a groove provided for this purpose on the under side of the thread board) whereby it may be pulled, and which connects it with the bolt of each latching device in the series employed to fasten the thread board down.

The thread board, 2, as previously mentioned, is hinged to its support by two leaf hinges, 4, one of which is set into the adjacent edge of the thread board, the other leaf being screwed to the lower face of the thread board support, having its inner edge flanged, as at 18, said flange extending into a groove, 19, of block, 20, upon which the slotted vertical portion, 21, of the bracket is bolted. Block 20 has a large elongated slot, 22, formed on it, which with slot in the vertical portion, 21, of bracket, 5, permits adjustment to a nicety. Block 20 is provided with a vertical rib, having sloping sides above the slot, 22, and which rib fits a corresponding groove in the bracket, 5, thus keeping the bracket from moving sidewise or from being displaced by torsional strain thereon.

AN IMPROVED PROCESS FOR WEIGHTING SILK.

In order to recompense the manufacturer for the loss in weight during the boiling-off process of silk (necessary to free the raw silk from its gum, i. e., the saliva the silk worm emits when spinning the thread as forming the cocoon) a considerable amount of silk is now weighted (artificially adding weight to the silk) with tin or other metallic or mineral salts, which when precipitated upon the silk fibre as microscopically-fine grains or crystals, have a cutting or chafing action on the fibre and consequently weaken it more or less by the friction to which the silk is exposed in the spooling, winding, and weaving processes and by subsequent use.

The object of the new process, the invention and patent of the Jechen Silk Weighting Co., is to overcome the deteriorating effect of the weighting process thus referred to, by first treating the silk by metallic or mineral salts in the usual manner, then washing it, then treating it by an alkaline bath containing both casein and phosphate of soda, and then washing it again.

THE PROCESS.

As mentioned before, the silk to be weighted is first put through a bath of bichlorid of tin or other metal salt (salts of iron instead of bichlorid of tin, if dyeing black) and then wrung and washed in the usual way, after which it is treated by a slightly alkaline bath of phosphate of soda of about 5° Baume, to which sufficient casein is added to bring it up to 7° or 8° Baume, and kept at this strength at a temperature of from 130 to 150° F. Afterwards the silk is again washed and wrung out. As will be readily understood, the process thus far explained is repeated until the amount of weighting required for a certain lot of silk under operation has been obtained, being careful to test the alkaline bath with the hydrometer after each passage, in order to get good results.

By the new process a considerable percentage of the casein becomes fixed on the previously weighted fibre, the thread is swelled, and in turn it is claimed, its weight, pliability and durability and lustre increased, being in excellent working condition for spooling, winding, weaving, etc. Silk thus treated will take dyes readily resulting in even and uniform shades.

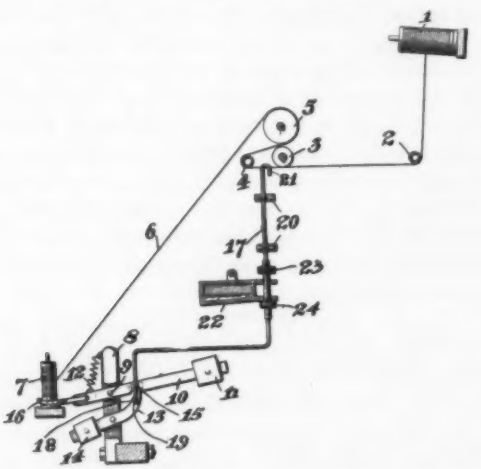
A NEW STOP MOTION FOR TWISTERS.

The object of the new device, the invention of Owen Williams, is to provide means so that when a thread breaks in the twisting frame, the mechanisms operating therewith automatically stop, and in turn raise the respective bobbin and hold it so until break is repaired, thus obviating whipping of the thread and in turn preventing waste of yarn.

The accompanying illustration is a diagramatic view of the new device, by means of which its working will be readily understood by the reader; more particularly when quoting numerals of references accompany-

ing said illustration, and of which 1 indicates one of the large spools provided for holding the yarn to be twisted; 2, 3, 4 and 5 a set of glass rollers, provided for each twisted thread. 6 indicates the direction of the thread through the device, i. e., from the delivery spool, 1, to the bobbin, 7.

With reference to the device itself, we find affixed to the frame of the machine an upright, 8, to which is pivoted at 9 a lever, 10, having a weight, 11, on its longer arm and a coil spring, 12, connecting its shorter arm to the upright, 8. Pivoted to the upright, 8, is a pawl, 13, having a weighted portion, 14, to thus throw the toe of the pawl into engagement with a notch, 15, in the lever, 10. On



its short arm, this lever is provided with a fork, 16, which engages with the bobbin, so that when the pawl is released from the lever the latter will carry the bobbin, 7, part way up its spindle, the two ends of the fork being also so arranged that when it is thrown in that position they strike the yarn on the bobbin with sufficient force to prevent the bobbin from turning.

17 designates a drop rod having a set-screw, 18, adapted to pass into an eye, 19, as provided to pawl, 13, and thus when the rod, 17, falls, it thereby depresses the pawl, 13, and in turn releases the lever, 10. The drop rod, 17, slides vertically in bearings, 20, on the frame of the machine, and is provided with a hook, 21, at its upper end, which straddles the thread, 6, between the rollers, 3 and 4; said thread normally holding the drop rod, 18, raised, the lever, 10, then being in its normal position, i. e., latched by the pawl, 13.

In order to increase the action of the stop motion, an additional device (22) is supplied; the same being a pivoted quicksilver receptacle, delicately balanced in a horizontal position, so that the quicksilver remains at the end of the receptacle farthest from the vertical portion of the drop rod, but that at the same time only a slight depression of the receptacle is sufficient to cause the quicksilver to shift to the end of the receptacle nearer the vertical portion of the drop rod, 18, which carries two adjustable collars or nuts, 23 and 24, the former striking the quicksilver receptacle and tilt it when the drop rod, 18, falls on the breaking of the thread, and the latter, 24, by its engagement with the receptacle raising the same when the drop rod is again hooked over the thread, 6.

THE ACTION OF THE STOP MOTION

consequently is thus: All its parts being in normal, or running position, as shown in our diagram, should then thread, 6, for one reason or the other break, the drop rod, 18, then loses its support on the thread, 6, and felling by gravity depresses the pawl, 13, and releases lever, 10, whereupon weight, 11, and spring, 12, cause the fork, 16, to raise the bobbin, 5, on its spindle and afterward engage with the yarn on the bobbin with sufficient force to prevent the bobbin from turning; the fall of the drop rod, 18, at the same time causing the collar, 23, to engage the quicksilver receptacle, 22, and tilt it, and in turn give a heavier and more positive blow to the pawl, 13. After the thread, 6, is then in turn repaired, the drop rod, 18, is hooked over the thread, 6, and thus lever, 10, pawl, 13, and bobbin, 7, are brought into their normal positions.

In the early part of the 17th century aprons were very much worn; they were small, but made up in costliness what they lacked in size. Mary Queen of Scots is said to have had over one hundred of varied size and color.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

COST KEEPING IN A COTTON YARN MILL

BY M. A. COOPER.

Reverting to the article in the March issue of this paper, under the above heading, the following remarks and illustrations will show the method adopted of ascertaining some of the particulars, which cannot be obtained from what might be termed the office books, though the latter are used more or less in conjunction.

It is necessary, in the first place, to keep track of every bale of cotton, not only as proof of its having been received, but to know exactly how it has been disposed of. For this purpose the head cotton mixer is supplied with a book, in which he has to enter all the bales of cotton as they come in, and which have previously been weighed by the warehouseman.

A form of this book is shown at Fig. 1.

From this record can be ascertained at any time the number of bales on hand in the

Mixing Room - Cotton Book

Date rec'd	No. of Bales	Mark	Yarn Bundle No.	Nov 21.	Nov 28.	Used Dec 5	Dec 12	Loss
Nov 11/04	8	SWW	321	////////=8				10%
" "	20	FTR	442	////////=14	////// =6			12%
" 14/04	42	JAT	926	////////=14	//////// =16	////// =12		8%
" "	14	AIN	295	////////=14				9%
" 15/04	50	BCD	1116	////////=14	//////// =16	////// =15	///// =5	11%
" 16/04	28	DEF	591	////// =6	/// =9	////// =13		9%
" "	32	AGE	638	///// =5	/// =9	////// =15	/// =3	12%
" 17/04	40	GBA	916	///// =5	/// =9	////// =12	////// =14	10%
" "	14	EEE	253	///// =5	////// =6			11%
" 18/04	25	ABC		///// =5	////// =6	////// =5	///// =5	9%
" "	38	HAT		///// =5	////// =6	////// =5	///// =5	10%
" 21/04	45	NNA			///// =5	///// =5	///// =5	11%
" 22/04	26	GBB			///// =5	///// =5	///// =5	11%
" "	40	FSA					////// =14	10%
" 23/04	50	ALA					/// =9	9%
" 24/04	38	HEN					////// =12	10%
" "	20	FRR					/// =9	11%
" 28/04	20	SSS					///// =5	9%
" "	10	ARA						

FIG. 1.

mixing room. As each lot is completed the tare is weighed and entered in the column for the purpose, then compared with the invoice to see that there has been no excess tare put on the bales.

On the right hand side it shows the percentage of loss in every lot of cotton. To obtain this, 50 lbs. of cotton are taken out of each lot as a sample (drawn from 10 different bales) and put through the machines up to the carding engine head. The loss in weight in going through these processes is thus determined and shown in the last column. These tests are invariably made on Saturday, as the machinery in this department is not run after Friday night, as at that time there are enough laps in front to feed the cards until Monday noon.

The system of feeding the cotton direct from the bale to the bale-breaker is open to discussion as to its advantages over the old method of putting 40 or 50 bales on a mixing.

The next book required, Fig. 2, is for the purpose of keeping track of all yarn taken into the cellar for "conditioning." This record also shows the amount of "damp or cellar gain" put into the yarn. Formerly yarn used to be left in the cellars for a week or ten days, in order to absorb the required amount of moisture, and in many instances it was steamed by an arrangement of perforated pipes, but under the newer system of "conditioning" machines, it is necessary for it to remain in the cellar only 24 hours.

Many firms still adhere to the old method of dampening, and no doubt it has its advantages, a great difference of opinion existing as to which is the better plan.

This method by which the gain for each count is shown acts as a guide for the cellar man. The fine counts do not absorb mois-

Cellar Book - Cops — Nov 28/04

No. of Spinner	30	32	34	36	38	40	42	44	46	48	50	Where sent
1	T 422											Reeling Room
2			T 385									" "
3					T 360							Winding Room
4							W. 301					Packed for J.B & S.
5											W 235	Packed for G.H.H
6									W 260			" " W.B. & S
7	T 416											" " J. B
8					T 371							" " G.H.H
9			T 392									Winding Room
10							W. 310					Packed for J.D & S
11		T. 402										" " "
12										W 248		" " W.B & S
13								W 278				" " J.B
14											W 227	" " G.H.H
used	838	402	777		731		611	278	260	248	462	= 4607 lbs Total
Nov 29	902	430	837		787		655	311	281	265	496	= 4964 - Dec 2
lbs gain	64	28	60		56		44	33	21	17	34	= 357 = 7.19% gain

FIG. 2.

ture to the same extent that coarse counts do, consequently it is necessary to show the gain for each count, to assist him in distributing the moisture equally as possible on all numbers. It also shows the cellar gain for each day and how the yarn from the cellar has been disposed of. Any faults in the yarn can be traced back to the spinner, as every set of cops is ticketed with the spinner's number and the count.

The letters, T and W, over the weights of each counts, indicate twist and weft respectively.

To be sure that the counts will be right after receiving the necessary amount of moisture, all the yarn is spun three counts on the light side—30's being spun 33's, etc. The warehouseman wraps each spinner's work every day, to see that the counts are of the required fineness. If too heavy, he at once reports to the superintendent, who goes into the matter with the overseer of the mule spinning; this regular wrapping keeps the counts right.

The cellar book for bundles is ruled exactly like Fig. 2, except that in place of the number of the spinner, it has the number of the reeler. The gain in weight is calculated as for the other record.

As the yarn is brought from the reeling room, it is weighed, and when it has laid in the cellar long enough to absorb the required amount of moisture, being turned over every day so as to distribute the moisture as evenly as possible, the cellar man weighs it and makes an entry of the total weight of each count in his book.

In the mills referred to, the whole of the production from the ring spinning rooms is taken direct to the reeling and winding rooms, every doffing bearing a ticket with the count and number of frame marked in large figures. It is then weighed, and the weight entered in the ring room weight book, which is ruled similar to the cellar book, the number of the spinning frame on the left hand side. Each set is marked R or

Beam and Warp Book Nov 28/04

Beams								Warps							
No of Beamer	Ends	30	32	34	36	40	Cal Weight lbs	No of Warper	Ends	30	32	34	36	40	Cal Weight lbs
1	420			590			590	1	2720					416	414
2	"	672					670	2	2000		476				478
3	440		638				641	3	2500			447			448
4	"					510	507	4	2000	494					497
5	380			562			563	5	2620				398		396
6	396					248	247	6	2800		470				473
7	390		546				548	7	2400			456			458
8	404	648					652	8	3000					428	425
9	"				541		540	9	2100	482					486
10	440			618			620	10	2250				412		410
11	560	321					323	11	2150		448				450
12	480		600				606	12	various			426			425
							6507								5360
		1641	1784	1770	541	758	6494			976	1394	1329	810	844	5353
Under ~~over~~ Calculation Weight							13	Under ~~over~~ Calculation Weight							7

FIG. 3.

W to indicate whether the yarn has gone for reeling or winding department.

From these books the production of every spinning frame in the mill can be kept constantly under supervision and any defects in the yarn caused by carelessness of the operative can be traced.

Some mills have their ring production dumped into the cellar, being spun on patent enamel bobbins, impervious to damp, and warranted not to warp, etc. After thoroughly trying this system for a time, the management of the mills referred to decided to adopt the method of "conditioning" their ring yarn on the winding, beaming and warping frames, which has decided advantages over the other system and which may be more minutely described in a future article.

The beams and warps are weighed as they come from the frames, and entered in the beam and warping weight book, ruled as shown at Fig. 3.

From this book the record of the daily production of every beamer and warper can be seen at a glance, and the foreman over these rooms is responsible for its being correct. The calculation weights are all worked out and entered in the book, and if the actual weights are not coming out satisfactorily the foreman increases or decreases the "tap" accordingly, but at the same time has instructions not to go beyond 8 per cent. or below 6 per cent. of moisture. If he finds he cannot adhere to these orders, he at once draws the superintendent's attention to it.

The percentage of gain in beams and warps is also ascertained from this book, being the difference between the weight of yarn received from the spinning rooms and the weight from the beaming and warping frames. This record shows variations weekly owing to more or less yarn being left on the bobbins, but by taking the average for three months, these variations are corrected.

These books, though simple in form, contain information which is of great value to the management of a mill, and enables the superintendent to see how the different orders are progressing. They are also useful in keeping track of yarn in process, and enabling complaints to be traced to their source. When operatives know there is a system of this description in vogue, they are more careful than otherwise would be the case, knowing that any bad work will be traced directly to them. An ounce of prevention is better than a pound of cure.

MUTUAL IMPROVEMENT SOCIETIES IN ENGLISH TEXTILE CENTRES.

Having read with interest accounts of the meetings of local improvement societies in textile towns in England, we asked the secretary of the Rochdale and District Woolen Mutual Improvement Society for particulars of his organization and have received from him an account of his society, its objects and methods of procedure. Accompanying the letter were copies of the prospectus and by-laws.

Rochdale, England, July 10, 1905.

Editor Textile World Record:

Your letter came to hand and we were pleased to receive it, for it shows us that some one across the water is taking notice of us. These improvement classes are becoming very popular here, especially in the cotton trade, almost every town having one, but ours is the only one we know of in the woolen trade. They have a society in the worsted places in Bradford and Leeds, but it is on rather different lines from ours. Our local cotton society has done a good work in training men for positions in the mill. They have rooms with machinery in them and are run at night or evenings for educational purposes.

We have been in existence about a year and have now taken a room and are putting in machinery, the object being to get every machine used in a woolen mill. At present we have a carding engine and two looms; we shall have a mule in two or three weeks. The cotton people have in their rooms all the machinery used in a cotton mill. It is really splendid to visit the place.

Anybody can become a member who wishes to do so, but they are generally people in the trade. All are working people and the society is worked and governed by them. The manufacturers are usually patrons and subscribe yearly. It pays them

to do so for they get three-fourths of the benefit, as their work people who are members grow more efficient.

Method of Working.—Over each department of machines the best men are chosen to be overseers, that is, they are responsible for the working of the machine, and also explain anything about it another member may desire to know. If a member wants to see or know something about the headstock of a mule it will be taken apart for him if necessary. We have lectures by some of our own members and by specialists on various machines; we also make visits on Saturday afternoons to machine works where the various machines are made. In getting machinery we beg as much as we can; failing that we get the builders to put it in at cost price by showing them it is as good as an advertisement.

The difference between the society, technical school and mill.—The society is composed of men from different mills and that brings an exchange of ideas. We have each machine used in a mill, only on a small scale. Any member can learn something about a machine with which he is not familiar, or if some difficulty turns up in his work, he can ask about it in the class and probably some one will be able to assist him. In the mill the worker in one department cannot go into other departments of the mill seeking information.

It may be asked if there is not machinery at technical schools. We say yes for the sake of argument, but generally the professors like them to be kept clean. One can scarcely look at them, certainly never pull them to pieces. At our classes the members come in contact with practical men who work on similar machines and so they help each other. At technical schools one is forced to attend the classes and sit for examinations. We have members that are too old to attend technical schools; one does not want to go to school forever. A member of the society may come to the lectures and use the machines when he thinks proper, although we like them to be regular. We work in connection with the technical schools and encourage the younger members to attend them.

I hope this rough letter will give you the information you require, and if a similar society is formed over there, we wish it every success. Harry Fielding, Sec.

POINTS ON CARDING.

BY SAM DRIVER.

(Continued from July.)

THE RING DOFFER.

Better and more yarn will be made from a given quantity of stock weighed out with the ring doffers running 18 turns than 24 turns per minute. Forty-eight inches will be covered by 24 rings on a doffer, the top rings 7/8 inches wide and the bottom rings one inch wide, the waste end rings 1 1/2 inches wide. The bottom doffer rings must be in perfect line with the spaces in the top doffer.

To ensure even yarn the tops and bottom should be spun separately, or the tops on one side of the mule and the bottoms on the other. There are several ways in which hooks can be taken from doffer rings. One way is to run the doffer points forward, applying a handcard charged with emery and oil, vibrating the handcard from end to end of the doffer, and reversing the doffer as soon as the hooks are off, and applying the handcard as before until the rings have become smooth. This treatment may not be the best in all cases; for example, when the card teeth are pitched forward too much they would come up irregularly and make an uneven surface. Some use a pine block of wood, square it at the ends, dip the end in the flour of emery and oil, and hold that against the points until the hooks are off. Some face the rings with the traverse grinder, then reverse and grind to a point. What are these hooks doing there? They have no business there. How came they there? Why, by simply grinding too hard or too long. A handcard filled with wool and vibrated across the rings for one or two hours or more is much preferred for polishing and smoothing the rings. This never fails.

Sometimes the leather in the rings has some spots softer than others. The rings

sometimes vary in length. These soft spots never have the same working capacity as the hard places. The wipe rolls should be set a little below the centre of the doffer and be covered with the best of corduroy. When the rings are hooked examine them with a microscope and it will be seen that the wire has an overhanging lip or burr on the front point. These lips take hold, but they don't let go as they should. If the wipe rolls are running too slow they will be apt to run over on some kinds of stock. Letting little things in the card room slide by causes endless trouble sometimes.

THE FANCY.

The fancy is the most important part of the card. All other parts of a card may be in perfect condition, but if the fancy is not doing its work properly it will be impossible to produce good work. An open set fancy with a low knee or a straight wire should be set to penetrate freely the wire on the cylinder surface 1/16 to 1/8 of an inch. The wire should be from one to four numbers coarser than the cylinder.

Straight tooth fancies are coming into general use for first and second breakers. On coarse open stock the best results will be obtained by running the fancy as slow as possible and still clear the cylinder. If the fancy wire is pitched too far forward it will not raise the stock from the cylinder as it should. The surface speed of the fancy and that of the cylinder should be in the proportion of 7 to 5 or 6. When a fancy shines like silver, the points of wire free from gum, free from streaks and not throwing the stock, it is doing its work properly providing it is not too hard on the cylinder.

Filleting clothing on the cylinder is very apt to wind the stock. When ordering filleting for the cylinder have it made with one-half or one-quarter of the wire left out every 8 inches or so. This will give the clothing a better biting power and make it more like a sheet cylinder. It will also be much easier to lift the stock from the cylinder. Sheet cylinders are the best for woolen cards.

If the card strippings come from the cylinder in a solid body on a sheet cylinder it is an indication that the fancy is at fault and its raising powers need strengthening. The fancy may be running too fast or too slow; if out of true it will cause the cylinder to wind and look wavy. If the points of wire on the cylinder are bent too far forward it will cause the fancy to wind. Sometimes putting on or taking off a lag of leather on the fancy pulley will have the desired effect on some kinds of stock. The fancy pulleys sometimes get loose, the stripper belt may be too slack. The shorter the staple the deeper the fancy must be set in the cylinder.

Winding fancies may be caused by hooked or crooked wire and by using the corner of the stripping card too hard. To run a fancy successfully its peculiarities need careful study. Never allow the points of wire on the fancy to get clogged with gum and dirt. The coarser the points of the fancy, so long as they are smooth and even, the greater will be the raising capacity. If the raising capacity of the fancy is too great for some kinds of stock, it may be running too fast or bearing on the cylinder too hard, or the wire may be too straight; this may be remedied by pressing hard on the grinder. Fancy wire bent too far forward will cause the cylinder to wind. It may be on the cylinder too hard and yet not do the work properly by reason of not having the right pitch. This can be remedied by combing the wire back with a hand comb to the right pitch, which is necessary to give the best results. Fancies running too fast will cause flying; if too slow, they cause the stock to wind. The fancy bearing on the cylinder too hard will cause it to wind stock. The fancy can be run lighter and more slowly if the cylinder is smooth and sharp.

If the wire on the cylinder is too far forward it will cause the fancy to throw stock and make knotty and nubby work. The only remedy is to comb the wire back with a handcomb and use a small emery board. It is a good idea to grind the fancy every month as it does better work with a flat point if smooth than with a needle point. If the fancy is running too fast or bearing too hard on the finisher, it will make fine strands on each side of the card and heavy strands in the middle. When the fancy belt gets oily it will slip on the fancy and cylinder pulleys.

Replace it with a new one; it will save trouble. Setting fancies by the tightness of gauge instead of depending altogether upon the ear is the best and surest way to get both sides alike. Have good stripper belts and keep them tight and clean.

The card room should be furnished with the best oil cans. Talent is power; tact is skill.

TWITS.

The scouring, dyeing, drying and oiling of the wool have much to do with the subsequent working of the stock. The writer has found out that bad work in these preparatory processes is a frequent cause of twits. There are, however, many causes of twits arising in the card room among which may be mentioned the following:

The fancy wire inclined too far forward.

The fancy winding or throwing stock.

Setting the fancy too hard or running it too fast.

Uneven speed of the spool drum.

Drawing the roving too tight between the rubs and spool stands.

Imperfect delivery from doffer rings.

Running the wipe rolls too fast or too slow for the doffer. If too slow, the fibres catch between the rings and wipe rolls carrying a little patch of stock over the doffer. When the wipe rolls are run too fast they gain on the doffer and cause breaks or weak places in the roving. Much tender yarn comes from this cause which is frequently overlooked. The wipe rolls should be run at a lower speed on short stock than on long.

Running the stripper belt too slack.

Hook points on the cylinder wire.

Blistered and slack sheets.

Cylinder and doffer out of true. In this case the twits occur at regular intervals.

Rough doffer rings.

Imperfect adjustment of the rub roll condensers. It is better to have the speed of each successive rub roll increased by a difference of one tooth instead of two.

Feather edge rings.

Bunches of wire missing from the doffer rings.

Setting the doffer and wire rolls too close to the cylinder.

A poor condition of the leader-in or tumbler.

Running the finisher too long without stopping.

Bruised or jammed rings.

Dull cylinders and doffers.

Running the fancy workers too fast.

Shives, sticks, broom straws, burrs, etc., clinging to the rings.

Too long a sweep of the eccentric on short stock.

Fibres sticking to the wipe rolls.

Worn-out wipe rolls.

Tumbler and finisher out of line. It is just as necessary to have the finisher wire free from hooks as the wire on the doffer rings.

All the belts on the finisher should be tight and then when starting the machine it will not be necessary to have two or three extra men to hold the belts from slipping off.

Talent makes the world wonder that it gets on no faster. Tact excites astonishment that it gets on as fast as it does and the secret is that it has no weight to carry; it makes no false steps; it hits the right nail on the head; it loses no time; it takes all hints; by keeping its eye on the weather-vane it is ready to take advantage of every wind that blows. It has the air of common-place and all the force of genius; it can change sides with a presto movement and be at all points of the compass, while talent is pondering and learnedly shifting a single point.

(To be continued.)

LONG AND SHORT BOBBINS.

BY HENRY BELL.

I have followed the discussion of this subject in the last two issues of the Textile World Record with much interest and will refer again to the illustrations printed some time ago when the matter was first brought up. Fig. 1 is the old 7-inch bobbin; Fig. 2 the new 8 1/2-inch bobbin. The manufacturers' position is summed up thus: The long bobbin holds more than twice as much yarn and will run twice as long, which should enable the weaver to run more looms at a reduced price per cut, do less work and receive the same price as before. The warp stop motion should save the weaver much

time and labor from picking out, etc. In the spinning room the long bobbin needs doffing only half as often, saving the weaver's time and labor.

The weaver admits that the theory of all this is fine, but in practice it works differently. On the long bobbin he claims that there are likely to be more breakages, especially in the bottom of the bobbin, as there is so much more drag at that point. One break on each bobbin kills the advantage of the long bobbin over the short one. If the yarn breaks more than once the weaver will very likely take the bobbin out of the

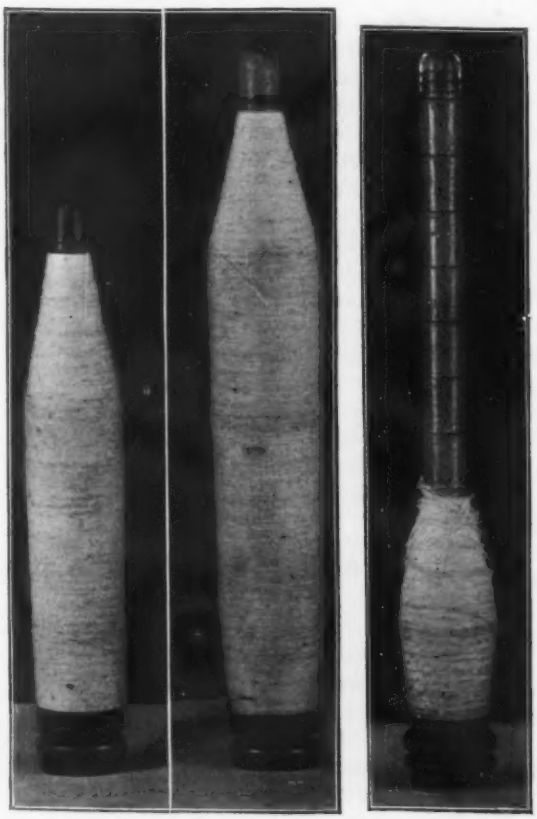


FIG. 1. FIG. 2. FIG. 3.

shuttle, put in a full bobbin and with a knife cut the yarn from the troublesome bobbin. Once a bobbin has been cut by a knife it causes no end of trouble, for yarn will catch on the slits and keep breaking, causing waste for the manufacturer and loss of time for the weaver. This controversy involves more than the weave room.

Fig. 3 shows a bobbin which a weaver would be likely to cut out. This could have been made by running too light a traveler, or again the yarn might be light, causing it to wind slack. The number of separate bobbins the weaver has to use determines largely the percentage of production he will get from the number of looms he can run.

Good warp and good filling are the most important features in the weave room; if you have these you will always have good help who will give you a good production. I have in mind two mills, both of which put in a certain style of loom at the same time. One mill gets 95 per cent. production and less than 1 per cent. of seconds; the other gets 90 per cent. of production and has 10 per cent. of seconds. Why is it? Because the manufacturer of the first does not neglect any item, however small, that helps to make good yarn, while the manufacturer in the second thinks anybody can run a card room and changes his men about once in three months. Such conditions are demoralizing and poor yarn is the result, giving the mill a bad reputation from which good weavers keep away.

The number of looms a weaver should run with the long bobbins and warp stop motion depends, in my mind, upon the conditions under which they are run. I should advise introducing the system gradually, giving the weaver one more loom at first, with a corresponding production and price per cut. If he finds that he can handle this all right and make as much or more pay, he will probably ask for another. In that way the problem would solve itself in time, as there are always some that are more industrious than others, and if the standard was set it would be comparatively easy to bring the other weavers up to that standard. Having arrived at a standard and worked out a proper price per cut that will enable the average operative to earn fair wages, I think manufacturers are wrong to insist that an operative on piece work should not make any more per week than before. The operative should be encouraged and allowed to make as much as possible and share with his employer the advantages, if any, that accrue from the improvements introduced.

ENGLISH NOTES.

(By our Special Correspondent.)

A special representative of the Manchester Guardian has been sending home from New York some observations on the dry goods trade of America which may interest American manufacturers. Taking his cues from large importers, the correspondent tells the English manufacturer that it is not alone the tariff that is answerable for the relatively small business now done with the States. It is claimed that Britons have studied American tastes too little and that no nation in the world is so able to extend her trade in America as the English. One leading importer declares that Lancashire makers of fine cottons have "no greater opportunity" than the American market affords. Yorkshire equally is accused of neglecting her chances to sell woolens and worsteds. Manufacturers are enjoined to send over their own emissaries twice a year to study the strategical position and if this be done a promise is foreshadowed of regaining the business lost during the last fifteen years.

That is a buyer's view of the situation. To find the opinions of manufacturers of high intelligence it is permissible to quote Mr. W. H. Mitchell of Fison & Co., Burley-in-Wharfedale. He has told in what way the manufacturer of worsted coatings managed to retain a little American business after the McKinley Act was passed. Worsteds previously sold here at a dollar had perforce to be sold for 80 cents. Bradford then had a stronger control of the wool market than now. Wool prices were sent down, profits were cut to the minimum, wages were reduced and mill-costs further economized. But the process could not be repeated to defeat Mr. Dingley's intention and so trade was lost. Nothing remains but the chance of beating Americans in skill and cunning and the handicap of from 104 to 140 per cent. in American favor is recognized by manufacturers as an almost insuperable difficulty in itself. While the evidently high opinion of English textile ability that is entertained in New York is flattering, there are substantial reasons for our English diffidence in accepting it as infallibly accurate. Woolen and worsted makers have decidedly given their best efforts in the somewhat barren battle against the Dingley enactment and their future triumphs are likeliest to be modest ones, whatever the case is to be in fine cotton fabrics.

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There are two ways of looking at the great extension of mill-building in Lancashire. Of these the more cheerful is that the machinery had better run in England than outside of it. But nobody doubts that the advent of 48 new mills spells temporary trouble for somebody. A total of 230,000 spindles are in work, a portion of a further new 550,000 are working, mills containing 2,520,000 are building, and 880,000 more are to be built. In all the accessions amount to 4,180,000 spindles of a capital value of 25 million dollars, offering employment to 10,000 work people. Some 20,000 new cotton looms are being put in and are finding work for 5,000 people. Lancashire is not lacking courage though the universal judgment is not in favor of these developments.

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Events gave American spinners of hosiery yarns quite a lively interest for a time in the prospective requirements of Japan. On this side some surprise has been expressed at the non-appearance of renewed demand. The absence is in some degree explained by a private message from Tokio. The frugal War Department is collecting the cast-off knitted goods of the troops and consigning them to Japan where they are converted anew into yarn and into underwear, which is reforwarded to the seat of war. Such management contrasts sharply with some in South Africa of which the world has heard.

* * * * *

The importance of trade marks in the export trade in cottons appears to have engaged attention in America. No doubt Manchester's multiplicity of marks gives England a lien upon a considerable volume of business. The merchant house of Ralli Bros. owns the rights in over 3,000 separate tickets, and Wm. Graham & Co., Ltd., and G. & R. Dewhurst, Ltd., approach similar proportions. In this profusion there is a positive

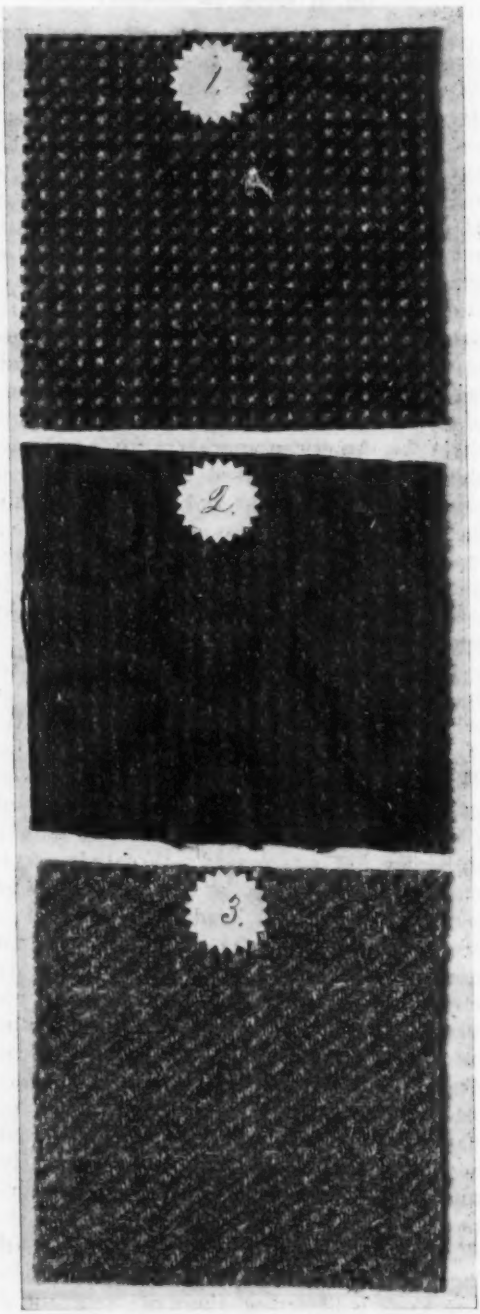
embarrassment. To concoct a new device that infringes on no older one is a matter of difficulty now that all common objects and most uncommon ones have been annexed and registered for exclusive use. As time goes by the likelihood is that longer terms of use will be required as titles to obtain protection.

Manufacturers' marks are much rarer. Horrockses, Crewdson & Co. have obtained a great hold on the domestic trade in calicoes and long cloths by means of proprietary marking. Sewing cotton is sold invariably under a brand. But if we except some specialties in flannels, Courtauld's crapes, Priestley's dress goods, Listor's plushes, Bliss's tweeds and a few others, little remains of manufacturers' markings.

Of course the community of middlemen is opposed directly to the policy of advertising cloths as proprietary articles. Dress goods merchants and drapers are less hostile than the tailoring distributers. Export merchants in woolens are notably averse from letting either their resident agents or their customers know the source of supply. "This bandying about of manufacturers' names," declared one of them, "is the curse of the business," when an agent's letter revealed the fact that he identified certain patterns as those of certain makers.

* * * * *

India is Great Britain's customer for $203,000,000 worth of goods per year. Cottons are the chief item in the trade, but woolens are of formidable account. A fact that would-be sellers ought to know is that woolens for India must be finished "smart." Perhaps too much smartness cannot be applied and though much of the business by reason of its extreme cheapness may be out of American reach, there are cloths not so remote. Worsteds of tropical weights in the pale greens, blues, purples, fawns and bastard shades, suitable for South America, are favored also in India. Some Scotch cloths are bought by the white and wealthy population and there is business in goods for uniforms. Khaki serges are in vogue constantly. Wide widths are sold for suitings and narrow widths (in 9 yard lengths, 100 ends to the bale) are used for "puttees" or helical leggings. Perhaps the most extraordinary value is given by Messrs. Hoyle of Huddersfield,



whose 14 oz. 54-inch khaki serge can be had at 25 cents from the mill. The warp is a

strong cotton one and the filling is much purer than would probably be expected at the price. It is of strong, hard fibre, clean and containing little cotton, so that it differs from the common mungo-made serge of the Leeds and Batley districts. Its manufacturer is renowned locally for his ability to transform all manner of rough and unpromising wools and wool wastes into serviceable weft.

Other goods selling in India as well as at home are 18 oz. Guiseley made coatings which are strong principally because alternate twos of ends and picks are wrapped in grandrelle fashion with cotton. These, as well as some superior but lighter woolen fancies, fetch some 50 cents at first hands, Figs. 1 and 2. For India there is business also in printed pilot cloths of heavy weight which are bought at about 30 cents. Our heavy woolen makers are receiving orders also for cow-hair and cotton sealskins, with laid pile, from 28 cents upwards, which become capes in China. A certain quantity of orders come also for 74-inch goods for ponchos to be worn in the Chinese deserts. As winter in Northern China is of some severity, there is a steady opening for soft finished, cotton warp beavers. Handsome shades of fawn and grey as well as darker self colors in 24-28 oz. weight and worth about 80 cents are favorites. As those who know our heavy woolen district will agree, such firms as G. & J. Stubley and Wilcock & J. Rhodes of Batley have reduced the production of beavers and the like to a fine point of perfection and economy.

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In fine spun woolens trade still favors costume flannels in mannish styles. These are cottony as to warp and soft in filling. A diagonal weave with and without a two-thread overcheck of color, Fig. 3, has been introduced by a Carlisle firm whose price of 29 cents, 42 inches, has been readily paid by merchants and makers-up. Variants on these styles made with similarly short, soft material are good for the cheap cap-trade which in this country is now quite a considerable industry in itself.

In 1904 the United States imported raw silk to the value of $56,453,975.

INGENUITY IN PLACE OF FILLING CHAIN.

BY GREENWICH.

Some years ago a mill that had been running on plain flannels and tricots wanted to change to fancy dress goods and decided that they must have a new designer and a different boss weaver. I accepted the position as boss weaver, and the new designer and I started in to get out samples on the pattern loom. Being so busy in this department we did not have time to look over the supplies or know what the mill had on hand until after the samples were made and sent to New York. All this time the mill had been closed with the exception of weaving the samples and finishing them.

The goods in demand at that time were large plaids, some of them three or four inches square. They were woven with a cotton weave on four harness with one harness up when the flake filling went in. When we made the samples we used the harness and filling chain which I think were 260 and 280 bars to a pattern. After looking over the weave room and some of the looms it occurred to me to see if we had a good supply of chainstuff. I looked around and could find but very little of harness chain. There was a larger quantity of filling chain, but not one-third what we should want, as the mill had forty looms. After looking everywhere I could think of I told the designer we should have to have a large number of bars of harness chain and filling chain also. He told me to look up what I had on hand and then he would give the order to the agent. I counted what was on the looms and in the supply room and found that with the styles they had the most orders on they would need at least 15,000 bars. I did not say anything about it until the next morning when I went to the pattern room to tell the designer. I found the agent with him. I told the agent we should want a large quantity of chain, but he told me there was plenty in the old mill. Thinking I had overlooked it the day before we all went out together. The agent said, "Don't you see that?"

"Is that all there is?" I asked.

"There is some more in the weave room," he answered.

This was just what I had looked over the day before and counted and found that we should need the 15,000 bars.

The agent nearly went crazy. He suggested to make a small sample and put the flake filling in the same as the regular filling and in the meantime he would send to New York and ask if they would not accept the cloth woven in that way. He did this in order not to go to the expense of buying chains. In a very short time the answer came back that they could not possibly take the goods unless they were made like the first sample.

All this time I had been trying to think of some way out of the difficulty and the designer and boss dresser, very bright fellows, were experimenting with the pattern loom, but they did not strike anything favorable. Finally after thinking a few days and lying awake a few nights I decided to try if a jack could be worked from the extra vibrator used for the sliding pick motion. First I drilled a half-inch hole through the arches of the loom about half way between the jack and the harness strap pulley on the loom, then I ran a rod through the hole and put on an arm with a set screw in it, and with a piece of one-eighth inch iron about 6 inches long, connected one of the jacks with the rod. In the other end where the vibrator extension was I let the rod run on the outside and connected it with the vibrator extension. Then I made the filling chain and used six bars in harness chain, where we would have had to run as many as there were picks to the pattern if made as they were on the pattern loom.

It being a cotton weave, one up and one down, we made our filling chain for this one harness by one up, one down on the chain the same as one harness, all the while working one harness from the filling chain. This worked all right, so when we wanted to have the flake filling go in we left off one riser on the filling chain of this jack. This worked without a hitch, but we had only a few looms built with five spaces in the comb at the box motion, so we had to try something a little different on the chain, there being only four spaces on the other looms for vibrators.

I remembered the half risers that were used years ago on Crompton 25-harness looms, where they had a pattern that called for 26 or 27 harness. These half risers, or link risers as they were called, were made to ride on the links of the harness chain, but instead of using them in the harness chain that they were intended for, I used them on the filling chain for the extra vibrator. This operation was all right, but we did not have these half-risers at the mill so I started for Worcester to see if they had them at the Knowles works. If they did not have them I knew I could get them at the Crompton works. At the Knowles shop they told me they were made of brass and were 2 1/2 cents apiece. At Crompton's they had a good supply on hand and said they were half a cent apiece. If I remember rightly I ordered 5,000 to be shipped at once by express and the next day they were at the mill. When the Crompton people sent in their bill they said they had made an error and that the price should have been one cent each, but as they had given us the price of half a cent they would let it go.

When they were put on and tried they were found to be O. K., but I thought if the links were different on a Crompton than on a Knowles (that is, in shape, I knew they were in length) then there was more trouble ahead, but a little rub of the file brought them into shape.

My troubles did not stop here. We had some 12-harness looms and the harness strap pulleys were so close to the jacks there was no room for the rod through the frame as on the other looms, so there was more thinking and studying. As they were 12-harness looms and had such a short space I put the vibrators on the 12, 11, 10 and 9 harness and used a dummy vibrator, that is, one with no gear or extension, put a block between the dummy, as I called it, and the 12 vibrator and bolted both together. This used the half risers on the filling chain, the half risers working the dummy and being connected with the 12-harness, worked it when wanted. This ended the trouble we had at the start. The agent looked brighter every loom he saw started and then came the trouble of educating the weavers for the fancy work. This took some little time, but as in all mills

we had quite a number that could go ahead without any trouble, and had a great run on the goods.

COTTON GOODS IN CUBA.

Editor Textile World Record:

The following is an extract from the Cuban customs tariff:

Paragraph 114. Tissues, plain and without figures, napped or not, weighing 10 kilograms or more per 100 square meters (18 lbs. per 100 sq. yards) unbleached, bleached or dyed, having:

a. Up to 9 threads, net weight, per kilog., $0.156 from other countries; $0.1092 from U. S.

b. From 10 to 15 threads, N. W. per kilog., $0.204 from other countries; $0.1428 from U. S.

c. From 16 to 19 threads, N. W. per kilog., $0.276 from other countries; $0.1932 from U. S.

d. 20 threads or more, N. W. per kilog., $0.42 from other countries; $0.294 from U. S.

(The above are the tariffs from the U. S. and from other countries, the differences being due to the reciprocity treaty.)

114e. The same tissues, printed or manufactured with dyed yarns: dutiable as tissue, with a surtax of 30 per cent. N. W.

Tissues not exceeding over 8 kil. per 100 square meters (15 lbs. per 100 sq. yds.), and not over 65 centimeters (25 1/2 inches) in width, admitted at rates in paragraph 114.

As I understand it, under the military government at the time of the American occupation, this restriction as to width was ruled out. The Cubans later reinserted it, and what you recently saw in the papers was that this discrimination as to width had been again done away with, the American representatives having convinced President Palma that the discrimination was unjust, and had been ruled against by the military Government, all of which rulings were to have remained in force.

I have talked with Mr. Steinhart, the Consul General from the U. S., who brought about the discontinuance of this discrimination, and he asserts that it was unjust to allow it to stand, for the reason that the European manufacturers bring "split" goods into Cuba under this provision, it being claimed by him that the split goods are really goods of greater width, that is, woven to great width, and are split to receive the advantage of the lower tariff provided for goods which are woven narrow. In other words, that the intention of the lower tariff for narrow goods was to apply only to goods woven narrow, and that the split goods were not entitled to this advantage. The Consul also claims that this ruling will be a great advantage to American manufacturers, who make goods wider than 65 centimeters (25 1/2 inches) and who do not split them.

Without venturing comment on the above, I would say that most of the piece goods coming to this market from England and Spain are loaded with clay and starch, which adulteration effects a saving in the cost of manufacture and also in the duties. It permits the offering of a piece of goods of fewer threads and at the same time of sufficient weight to pass in under the lower schedule, since the same goods pay more when weighing less, as shown in paragraph 115, which is as follows:

Tissues, plain and without figures, napped or not, weighing less than 10 kilograms per 100 sq. meters (18 lbs. per 100 sq. yds.), unbleached, bleached, or dyed, having:

a. Up to 6 threads, N. W. per kilog., $0.18 from other countries; $0.126 from U. S.

b. From 7 to 11 threads, per kilog., $0.24 from other countries; $0.168 from U. S.

c. From 12 to 15 threads, per kilog., $0.324 from other countries; $0.2268 from U. S.

d. From 16 to 19 threads, per kilog., $0.444 from other countries; $0.3108 from U. S.

e. 20 threads or more, per kilog., $0.60 from other countries; $0.42 from U. S.

I recall your expressed opinion that the reciprocity treaty would not facilitate to any great extent the sale of American goods in Cuba, and your conclusions were in the main correct. We are doing considerable in this department of our business, but mostly in specialties, such as misses' hose, towels, tobacco shade cloth, etc., but the great volume of cotton piece goods continues to come from Europe. Some printed calicoes are being sold here from New England, and a number of American manufacturers have undertaken with some success to make goods specially "loaded" for this market.

American cotton goods need, and in the opinion of many are entitled to still greater favor than is now provided for them in the

Cuban tariffs. The reciprocity treaty has been in large measure responsible for the present prosperity in Cuba, both directly and indirectly, and the benefit seems to have gone almost altogether to Cuba. Imports from the United States have increased, but the greatest increase has been in those lines which would come from the United States in any event, and has not been caused by reduction in the tariffs, but by increased consumption. There are those of us who believe that before the expiration of the present treaty, the United States will ask and receive from Cuba a tariff arrangement that will be more favorable to American cotton goods. In view of the fact that 83 per cent. of the exports of Cuba are sent to the United States, and that the United States supplies only about 40 per cent. of Cuba's imports, the present tariff arrangement of Cuba does not seem to be fair to the products of the United States.

Answering your inquiry as to the use of the metric system in Cuba, I would say that this system is used officially by the government in all its departments. Distances in the country are mostly reckoned by the metric system, though dimensions of land are generally given in terms based on the old Spanish system. Goods are retailed in stores under the metric system of weights, but mostly under Spanish pounds. Measures are made at wholesale and retail under the Spanish vara, which is somewhat less than our yard, and also under the metric system, and in some instances in English yards. Tailor shops invariably take measures in meters and centimeters. Shoes are sold by both French and American measurements; collars and cuffs, the same.

In other words, measurements are so mixed here that it is impossible to give an accurate idea as to what system is most in use, taking all classes of business into consideration. It seems to us that in the measurement of textiles the metric system is as well understood generally as any, and is probably more often applied.

Yours very truly,

Frank G. Robins & Co.,

Selling Agents, Aguiar 102, Havana.

FILLING DRAWN IN AT SELVAGE.

Editor Textile World Record:

For the benefit of young loom fixers I will give an experience I had with a loom which was catching filling and making a fringe on the selvage on the side farthest from the filling fork. At the time I was running a section of old looms with dobbies which had the horizontal lever. These dobbies had been running over ten years on sateen cloth and were being changed over to run fancies about 30 inches wide. The reed space of the loom was 48 inches, thus causing a long length of filling between the selvage and shuttle box.

I was called to one of these looms because the filling fork made a fringe on the selvage. I watched the loom a while, but couldn't find the cause, so I took the picker off, smoothed the rough places and sandpapered the box front, which was a wooden one with the swell or binder in it. Next I smoothed up the box bottom and binder, but this did not stop the trouble. Sometimes a rough place on any of these parts will catch the filling, and the filling will free itself before one can see what it has caught on.

At last I called the attention of one of our old fixers to it. So he looked the loom over and stood watching it run. All at once he heard a noise made by one of the horizontal levers. We watched the levers awhile and saw one drop instead of being lowered. Then we watched the hooks on the dobby and saw one slip from the knife when about three-quarters of an inch from the end of the stroke, and this made the lever drop.

The pattern was a sateen stripe and one of the harnesses was worked by this hook, which was worn so that it did not catch firmly on the knife and the harness dropped down just as the shuttle was getting out of the shed. This trapped the filling by the falling threads before all the slack filling between the selvage and shuttle box could be drawn up, and left a tail of filling hanging on the selvage. I put on a new hook in the jack and had no more trouble with the loom making a fringe on the selvage. Fancy Stripe.

A NEW COP TUBE.

A cop-tube for cop spinning frames, recently patented in this country, is shown in the accompanying illustrations. In his description of the device the inventor states that ordinarily cop-tubes are made from brass or other metal tubes, and in handling the same and when off the spindle they are apt to be sprung somewhat out of a straight line by rough usage, and thereafter cannot be readily applied to the spindle. These cop-tubes are commonly used on dead-spindles of what is known as cap-spinning machines. The new cop-tube comprises a tube of metal having a spiral slot extended from near one end toward and near the opposite end. Should the tube become bent in handling or by being dropped upon the floor it is sufficiently flexible to adapt itself readily to the spindle, and it may be properly revolved about the spindle in the winding of the yarn being spun.

Fig. 1 is a side elevation and represents a portion of a cap-spinning machine with the improved cop-tube. Fig. 2 shows the cop-tube detached.

In the spindle-rail is mounted the foot of a dead-spindle, B, provided at its upper end with a cap, C. The rail, A, receives one or more usual guide-rods, the upper ends of which sustain a lifting-rail. The lifting-rail about the dead-spindle is provided with a drag or washer, a, which may be felt or leather. This spindle sustains the cop-tube which comprises a barrel, b, and connected head, c, the head being made as a pulley to receive a belt driven in any usual way by which to rotate the cop-tube about the spindle.

Usually the barrel of a cop-tube is unslotted, and consequently stiff, and when bent or distorted it is very difficult, if not quite impossible, to restore it again to its normal position. In accordance with this invention a spiral slot, d, is started near the head, and terminates at the point 3, a short distance below the upper end of the barrel of the tube, the tube by reason of this spiral slot being made sufficiently flexible throughout the greater portion of its length; consequently, should the barrel be bent by rough handling when off the spindle it will readily adapt itself to the spindle when the cop-tube is again applied.

It is claimed that a cop-tube slotted, as here described, possesses far greater durability than the ordinary unslotted tube, and that the slotted cop-tube will readily adapt itself to any variation in the spindles themselves, it being well understood that the spindles and cap-spinning frames are subjected to much rough usage and are liable to be bent out of true. An ordinary unslotted

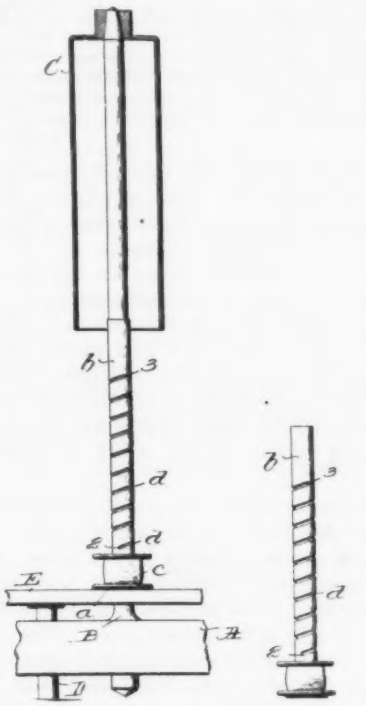


FIG. 1. FIG 2.

tube cannot be applied to a spindle under such conditions and be used, for the reason that the increased function retards the speed of the cop-tube, so that it cannot be run evenly, and variations in the speed or a loss of speed results in what is commonly designated as "soft-twisted yarn."

The slot, d, shown is represented as cut from the left hand, this being necessary when the tube is run to the right, but should the tube be run to the left the spiral can be cut from the right.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Soft Noses on Mules.

Editor Textile World Record:

We are spinning 7/8 to 1 1/4 run yarn on English and American mules and are troubled with soft noses on the bobbins which cause the filling to slip from the bobbin during weaving and make much waste. Can you suggest a remedy?

Ridley (542).

We have secured the following expert opinion on this trouble, the cause of which is very difficult to point out without knowing all the conditions in the mill where it exists.

Be sure that the quadrant on the mule is not set too far back, as this will invariably cause the mule to wind hard on the shoulder and soft or slack on the nose. If it is a Davis and Furber machine be sure that the two centre tracks are perfectly true and level, otherwise it will wind with soft places. The builder rail should also be in such a position as will insure an even wind.

Holz.

In order to answer the question fully we ought to have full details of the style of mule, together with the number of teeth in the gears, the kind of quadrant plate, builder, etc. Soft noses on bobbins can often be remedied by setting the quadrant arm a little lower down. This has the effect of turning the spindles faster when the yarn is being wound on the nose, thus making them tighter. The difficulty might also be caused by the faller leg knocking off the square stud too soon, or it may be that there is something that is imperfectly set just at the finish of the draw so that the weight is taken off the yarn and the yarn is not wound on the nose under tension. There are so many things that might cause this difficulty, and which vary with each type of mule, that we can give only general information without knowing more of the details. Wilts.

There are many things that might cause the trouble which Ridley mentions. The floor may be uneven; the track may drop as it goes toward the head and the machine get ahead of the wind; the faller might trip too quickly. If we could have one of the bobbins sent us we think there is no difficulty in finding a remedy. Lincoln.

Fuzzy Silk.

Editor Textile World Record:

Enclosed is a sample of taffeta. By looking across its surface a slight fuzz is noticed. Can you explain this fault? Cabot (558).

The sample is almost too small to state with certainty what the trouble is, but it appears to be what is called "lousiness." This is caused by a disease of the silk worm. Volumes have already been written about it and much litigation taken place on account of it. Italian silks are much more subject to it than the Japanese. Some time ago the Silk Association of America took up the subject and brought it before a board of experts composed of raw silk importers, throwsters, manufacturers and dyers. The conclusion they reached was that the defect was such that it could not be detected in the raw silk and that neither the importer nor the dyer could be held responsible for it. Alfred Coradi.

Commission to Salesmen.

Editor Textile World Record:

We had a salesman that was not wholly satisfactory and we let him go. Some customers that he brought to us are still buying. We would like to know if the salesman is entitled to a commission on sales made to these parties subsequent to his dismissal? He was on a commission basis only.

Vancouver (567).

Usually such cases are matters of agreement. We do not think a salesman is entitled to a commission after he has left the employ of a concern except where a specific agreement has been entered into to pay such commissions. It is not the practice in the cloth and yarn trade to pay such commissions unless possibly where the salesman secured a trial order for a small quantity of the goods and after he left the balance of the goods were ordered. The question of commissions has been the cause of many law suits and yet we think no definite rule has been established which covers all cases.

Terms on Jeans.

Editor Textile World Record:

Will you kindly publish the terms and discounts given by the Jeans Manufacturers' Associations?

Monroe (574).

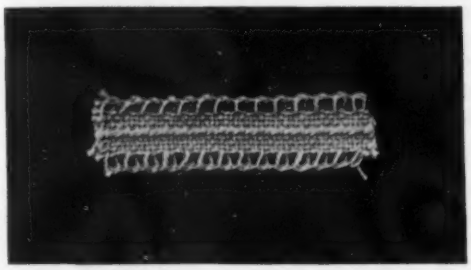
We understand that the terms and discounts are as follows: 4-10 October 1, for deliveries made during May, June, July, August and September. After October 1 they are 4-10 60 from end of the month. Goods to be shipped direct from the mills, and they allow freight east of the Mississippi at the rate of 50 cents per hundred pounds.

Tape Binding.

Editor Textile World Record:

Can you tell us how to make goods like the enclosed sample? Elmore (550).

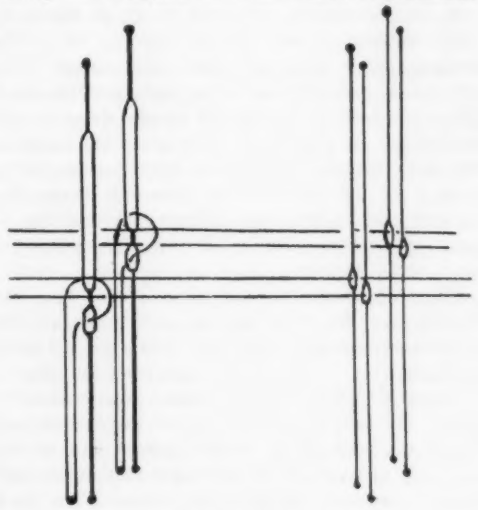
The sample enclosed, which is shown in the accompanying illustration, is a tape with leno edge, sometimes called hemstitch tape binding. The hemstitch weave gives a firm edge to the tape and is far better than the common loop edge tape and has a wider range of usefulness. The fabric can be produced on an ordinary tape loom with cam shedding motion, although a dobby might be preferred on account of the wider range of goods that could be made. If sectional plate cams are used, that is, with the section bolted to the plate



according to the pattern required, no special construction is necessary so long as one revolution of the cams equals or is a multiple of the picks in the pattern.

In the sample, the threads on the extreme edges work at different intervals, necessitating the use of several more harness than would be required if both edges were the same. If both edges were the same the tape would probably look just as well and be just as serviceable. No special apparatus is required besides the regular leno attachments which will be described.

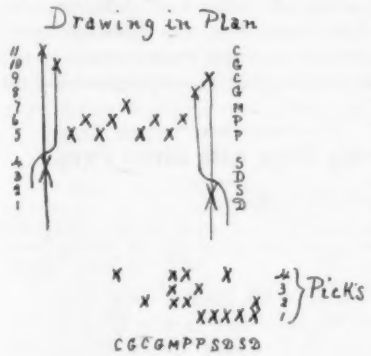
First method: Eleven harnesses are required, doup and standard for one edge, ground and crossing thread harness for the same; doup and standard for the other edge, ground and crossing thread harness for the same; two harness for the plain weave, one harness for the coarse mercerized thread. One easing or slackening rod would serve for all crossing threads, as one crossing pick can be arranged for both edges, and instead of an extra cam the easing rod can be connected to one of the standard harness.



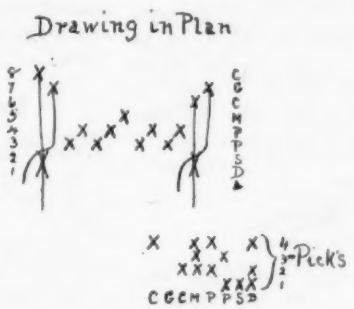
THE DOUP PLAN.

Second method: Eight harness are required, one doup and standard for both edges; one ground and crossing thread harness for one edge, one crossing thread harness for the other edge; two harness for the plain weave, one for the mercerized yarn. The easing rod is worked as in the first method.

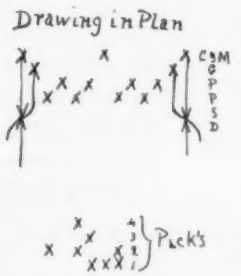
Third method: This consists in weaving the tape wrong side up on six harness and also mak-



FIRST METHOD.



SECOND METHOD.



THIRD METHOD.

ing both edges the same. One doup and standard harness, one ground and crossing thread harness for the same, two harness for the plain weave and using the crossing thread harness for the mercerized thread. The easing rod as before.

A temple wire is required for both edges by each method to prevent the drawing in of the threads which give the open work effect. The wires are pointed and pass through the reed. They are held by means of strings fixed to the back brace or whip roll. The wires are lifted at the time the shuttle returns to form the filling loop. As the tape weaves down it draws the pointed end of the wire. The easing rod can be made to cross the whole width of the loom or in sections as desired.

The sketch of the doup plan shows how the threads are drawn in and over the doup. The drawing-in and cam plans are shown for all three methods. A cross in the cam plan indicates a crossing of the harness. D, doup; S, standard; P, plain; M, mercerized thread; G, ground thread. There are four picks to the pattern and as the cams are generally made for eight picks there will be two patterns for each revolution. The yarn would be about 2/30 for the edges, 2/20 for the filling and plain threads, and 2/10 for the mercerized yarn. Will Nelson.

Rolling of Warp.

Editor Textile World Record:

In your June issue I note that one of your readers is troubled with rolling of the warp in making goods with a 4-leaf basket weave. I had the same trouble and overcame it by using two 12 1/2 reeds. The warp will have to be reeded so as to divide the cut-offs in the weave and have one just behind the other. I tried this and found it worked all right and offer the suggestion in the hope that it may give some help to Alpha. Omega.

Oiling Cotton Mixes.

Editor Textile World Record:

What can we use on a cotton mix (waste and short fibres) to keep it from flying and losing so much in carding? We have been using oil, but this colors white mixes to some extent, and is also objectionable to buyers who want to dye the yarn. How much should we use to 100 pounds of raw cotton? Tyler (525.)

For this purpose we would advise using Turkey red oil. Make a mixture of 2 to 3 gallons of Turkey red oil, 25 pounds Glauber's salts, and 50 gallons of water. Sprinkle over the mix with a broom or watering can. This oil will assist the dyeing and has no oily odor. Baumwolle.

Is the Mule Spindle Holding Its Own in This Country?

Editor Textile World Record:

Will you kindly advise me if the proportion of mule spindles in operation in this country is as large as it was 10 years ago, and whether it is true that the frame spindle is driving the mule spindle out of our mills. I have heard in some quarters the statement that a reaction has set in in favor of the mule spindle. On the other hand, I understand that one of the largest Rhode Island manufacturers is changing over a 100,000 spindle mill and equipping it entirely with frame spindles, throwing out his mules. Mule Spinner (572).

We should say that the mule spindle was not holding its own against the frame. The troubles that manufacturers have had with mule spinners' unions have disgusted them with mule spinning, and the great improvement that is constantly being made in the spinning frame enables this machine to spin almost as fine and for many purposes make as good yarn as the mule.

In this country at the present time a number of mills are spinning upwards of 100's on frames, and we know of one mill in Fall River which has been spinning as high as 160's on a Mason frame. The yarn is harder twisted and perhaps more uneven than mule spun. In England the mule is thought much more of than it is here.

We should say the only increasing use for mules is in direction of coarse work for hosiery yarns and for the spinning of waste yarns. The census of 1900 gave 5,563,480 mule spindles and 13,444,872 frame spindles in operation in the United States. Since that time there have been over 6,000,000 spindles added, and we should think 500,000 would be a fair estimate for the number of additional mule spindles.

Dyeing Black with Direct Dyes.

Editor Textile World Record:

In dyeing blacks on cotton yarn with direct dyes is it customary to boil yarn out or merely wet it out? Buxton (565).

This depends upon the kind of black wanted. In nearly all dye houses where yarn is dyed, it is first boiled out from four to eight hours, with or without pressure, and in either open or closed kier. In many instances the yarn is entered without any previous wetting out and dyed and wet out in the dye bath, but this is more likely to give streaky yarn than if it is properly wet out. My opinion, based on twenty years' experience, is that the best results are obtained when the yarn is well boiled out, but it can be, and in many cases is dyed without any boiling out whatever and serves the purpose for which it was intended. Baumwolle.

Colors and Shades.

Editor Textile World Record:

How many colors are there and how many shades are made from them? Royal (576).

Authorities differ as to the number of primary colors, but all agree that red, blue and yellow are simple or primary colors, and some writers add green and violet. Red, blue and yellow are regarded as simple colors because when mixed with each other and with black and white every possible shade or color may be obtained. The so-called combined colors are of two classes, secondary and tertiary. The secondary colors—green, orange, purple—are composed of two primaries, while the tertiaries are composed of two secondaries. The number of shades made from the different colors is unlimited and authorities also differ as to what constitutes a color and what constitutes a shade.

The science of colors as applied to textiles has been exhaustively treated by Paterson in his little book, "Science of Color Mixing," and by Beaumont in "Color in Woven Design."

Twist in Ply Yarn.

Editor Textile World Record:

What is the rule for calculating the twist in ply yarn? For example, if 36s 3-ply cotton gets 10 turns per inch of twist, what twist should 4-ply get to be in exact proportion. Wessex (535.)

The twist in ply yarn of different sizes is regulated in proportion to the square root of the ply count. The number of turns per inch is determined by multiplying the square root of the ply count by a number which is a constant for all sizes in which the twist is to be of the same degree of hardness. If 4 is used as a constant, the turns of twist in 3/36s would be found as follows:

square root of $12 = 3.47$.

$3.47 \times 4 = 13.88$ turns.

The turns of twist in 4/36s in the same proportion would be found as follows:—

square root of $9 = 3$.

$3 \times 4 = 12$ turns.

This rule holds good for any fixed weight system of count, cotton, worsted, linen, or run, but the constant must be selected to suit each system of numbering. In the example given by Wessex there are 10 turns per inch in 3/36s. Reversing the process already explained the constant for this twist is found as follows:—

square root of $12 = 3.47$.

10 (turns) $\div$ $3.47 = 2.88$, constant.

The twist for 4/36s at this rate is then calculated as follows:—

square root of $9 = 3$.

$3 \times 2.88 = 8.64$, turns.

Dressing for Jacquard Cords.

Editor Textile World Record:

How can we make or where can we get a preparation to put on the harness cords of jacquard looms to keep the harness from wearing out at the top of the loom where the harness wears on the glass bars. Chippewa (557).

I understand that a mixture of graphite and tallow is sometimes used to prevent the cords wearing quickly. For dressing our jacquard harnesses we use a preparation that we obtain from Crompton & Knowles Loom Works, Providence R. I. Lewm.

If there is a wide angle to the harness, that is a somewhat wide width of cloth, the glass rods have a tendency to become heated. They sometimes become warm with a narrow harness, especially if the loom is running at a high speed. This heating of the rods has a tendency to rot the harness or neck cords and to overcome this fault we have used wood rollers about seven-eighths of an inch in diameter.

A preparation of pure carriage varnish, without dryer, and beeswax, or boiled oil and beeswax in the proportion of four parts of oil or varnish to one of wax, is the best dressing for the purpose. Practical.

Spinning Prices.

Editor Textile World Record:

Can you give us the basis of prices on which custom spinning of woolen yarns is done from 1 to 10 runs? Erickson (551).

We are informed that the prices for spinning woolen yarn run about as follows: 2 1/2 run, 7 cents; 3 1/2 run, 9 cents; 4 1/2 run, 11 cents; 5 run, 12 cents. There is very little yarn spun above 6 run.

Continuous Yarn Tester.

Editor Textile World Record:

Where can I get a continuous yarn tester that indicates the strength and elasticity of the yarn as the latter is run through the machine? Highland (552).

We have given our correspondent the address of a firm selling a continuous tester such as he describes. These machines are not considered reliable as the slightest change of speed or tension of the yarn affects the indicated elasticity and strength. The results are therefore only relative, and however attractive the principle of the machine may be in theory, greater satisfaction will be found in the use of the ordinary type of tester, although the operation entails more time and labor.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

A careful inquiry reveals the fact that at the present time there is still considerable business to be placed on spring underwear. Most of this is for legitimate needs, while some of it is business that buyers are seeking to place on low grade numbers in addition to orders that they have already placed. The object of their seeking to place additional orders is for fear a certain percentage of the lower priced numbers will not be delivered, owing to the continued advance in the price of cotton and by contracting for a quantity in excess of what they really need. They expect to be able to get enough to fill the requirements.

Another feature which has a tendency to complicate matters in the market is the fact that some manufacturers have undoubtedly accepted orders in excess of their capacity and this fact has become known among the buyers.

Most lines of men's balbriggans at $2.00 and under have been advanced 10c. to 15c. per dozen over prices quoted last month and several lines have been withdrawn altogether.

Men's ribbed goods are not in quite so strong a position as the balbriggans, but advances of 5c. to 10c. per dozen are being asked on nearly all the low priced numbers.

The ladies' straight ribbed vests at from 60c. to $1.00 are well conditioned and fairly liberal orders have been placed at advances from 2 1/2c. to 5c. per dozen.

Notwithstanding the present conditions of the raw material market, a very prominent manufacturer of ladies' shaped goods has sold up his output on a basis of 10c. per dozen less than last year's prices. In other words, the garment that he sold last season in high neck, long sleeve, with mercerized trim at $1.95, was sold this season at $1.85, or he has put on a silk trim on the same vest at $1.95. This manufacturer also shows a line of lisle thread goods, hand finished garments with Jap silk braid at $3 75, or with machine trim at $3.67 1/2. He apparently has little difficulty in selling his entire production to less than twenty customers each season and we have heard his competitors say that they cannot understand how he can give so much for the money. Nevertheless, each season finds him in the front rank and those people who use his merchandise have nothing but praise for the manner in which every case opens up.

A GERMAN LISLE VEST.

The Eureka Knitting Co. have about sold up their production of ladies' straight ribbed vests at practically last season's prices. They make a ladies' full taped garment at 65c. regular and trim the same cloth up in a variety of designs which brings their range up to about 95c. Thev sold a few of these numbers at 2 1/2c. per dozen less than last year, but the majority of their numbers are at the same price.

Bateson & Dowd report a very heavy busi-

ness during the month of July on the Southdown Knitting Co. and Standard Knitting Co.'s lines. These are practically at last season's prices. They are showing some handsome new designs of straight vests with hand embroidered trimming made by the Southdown Knitting Co. at $3.25. These are better fabric and just as well trimmed as the German goods which land at about $3.85.

We illustrate in this issue some new designs of German lisle vests made by A. Doehner of Chemnitz, being brought out to retail at $1.00 to $1.50 a garment.

A GERMAN LISLE VEST.

We notice that considerable business is being done this season both by domestic and foreign manufacturers on ladies' straight vests made with shields. These have been shown in a limited way for several seasons past, but not until this season has the public taken them very readily.

In men's goods the Utica Knitting Co. report a very heavy business on a line of mercerized goods at $3.65 in blue, salmon and tan colors. The difficulty heretofore with this class of merchandise has been that they were too rigid and hard. The above mentioned concern have succeeded in producing a garment that is quite elastic and very sightly.

Union suits for men continue to gain in popularity and constitute an important item in the men's line. Calls are now heard for these garments with short sleeves, short legs and also with the drop seats.

The demand for ladies' lace trimmed pants and combination suits has fallen off slightly in favor of those with tight fitting knees which permit of a more satisfactory adjustment of the garter.

Mesh goods for ladies and men have not been as successful this season as was anticipated. This is, perhaps, due to the impression that prevails that garments so made are not as durable as plain fabrics. We notice, however, an increased tendency toward very light weight gauzy fabrics instead.

Manufacturers are now busy delivering fall weights and while we hear of very little inquiry for duplicates, yet the market is strong, necessarily on account of the raw material conditions.

Ladies' 8 lb. ribbed vests are being held firmly at $2.00, but 7 lb. goods may be obtained at $1.85.

A number of manufacturers of men's fleeces have either advanced their prices from $3.25 and $3.37 1/2 to $3.50 or have withdrawn everything from sale. One exception to this, however, is a very prominent manufacturer, in fact, we think the largest manufacturer of this class of goods, who states he is still open for orders for standard weight goods at $3.25.

Wool goods are in great demand and unlike cotton goods, there is not an opportunity for manufacturers to speculate on any decline in the price of material and therefore, buyers are quite certain of having to pay advances on all duplicates.

HOSIERY.

The bulk of the buying of hosiery for spring is now completed and we understand that quite a large proportion of the business has been booked from 2 1/2 to 5 per cent. higher than prices quoted in the month of June. Of course, buyers objected to paying these advances, but it was found that the larger producers were very firm in their determination to get them and as the raw material conditions did not improve any, the buyers were forced to pay the advances or

go without the merchandise. Some manufacturers who went out early and took business at the low prices wished that they had fewer orders on their books, so as to be able to take advantage at the better prices made afterward. Now, the buyers who bought early are getting anxious about deliveries and it is predicted that the proportion of goods sold at low prices that will not be delivered will be larger than during any previous season.

Import business has been placed so heavily that the Chemnitz market is reported to be practically sold up to next June.

Lace goods are still having a heavy run and most German manufacturers have been sold up for sometime. This demand is not only from the United States, but from Australia, South America and in fact, the entire civilized world is calling for lace hose for their ladies.

Embroidered goods are about the only fancy hose being sold, especially to the finer trade. The domestic manufacturer has not been able to perfect this branch of the business, so as to interfere with the German made goods to the extent that the domestic lace goods have.

It was predicted some time ago that the light weight gauze goods would not continue to be popular on account of their not wearing well, but this has been in a degree obviated by having them made with double feet and today they are in good demand.

While many high colors are shown by retailers and jobbers, no large volume of business is being done on it, the heavy orders being for black, white and tan, and indications are that white and tan will be better than ever for 1906.

SWEATERS.

The sweater business becomes more steady as the season advances. Men's sweaters have been in demand for some time, but there has been some uneasiness felt in regard to ladies' blouses. This, however, is being dispelled by a satisfactory demand.

The call is mostly for plain blouses with moderate sleeves, little encouragement being given to extreme novelties. Those with the wide sleeve at the wrist are not being taken well, the preference being shown for those full at the top only.

A striking design shown is one that buttons at the back with a vest and standing colar of contrasting color.

WASTE IN KNITTING.

BY MORRIS MURCH.

I have read with interest Nantucket's comment in the June issue on this subject, and notice that the average per week for ten weeks was .585 of 1 per cent. I have been employed for some time in knitting men's ribbed underwear, and much of it from carded peeler yarn, which I think makes as much waste as any grade of yarn used for men's ribbed underwear, and I am pleased to learn that my waste percentage is less than Nantucket's.

My weekly percentage of waste varies from .08 to .14 of 1 per cent. and I am convinced that if all the knitters did as well as some of them do these figures could be somewhat improved. It may be that in Nantucket's case the knitters were paid according to the amount of cloth produced, which would tend to make them overlook a little extra waste, if thereby more cloth were knit.

I do not think that 2 per cent. is sufficient to cover the weight of cones, tissue paper in which the yarn is usually wrapped, and the paper with which the case is lined. I have investigated the matter somewhat, considering several makes of yarn, some from the South and some from the East. I find that the cones are as often wrapped in stout wrapping paper as in tissue paper, especially when the yarn is likely to be shipped to some distance. An ordinary case of yarn of 400 pounds net is pretty sure to contain at least three pounds of paper, and often four or five pounds, and this means 3/4 of 1 per cent. at least.

Turning to the cones of yarn, I find that they weigh anywhere from 26 to 40 ounces each: if they weigh 40 ounces there will be 160 paper cones in a 400-pound case. These paper cones usually weigh about 5 1/4 pounds per 100 and 160 would weigh 8.4 pounds, or 2.1 per cent. of 400 pounds. Adding to this

3/4 per cent. of paper and we have 2.85 per cent. of material which cannot be knit, and for which the yarn manufacturer allows 2 per cent. If the cones in the case weigh only 32 ounces each, which is not unusual, there will be 10 1/2 pounds of paper cones, or 2 5/8 per cent., and as the cones are smaller there will be more of them and more wrappers will be used, so that there will be nearly 4 per cent. of paper in various forms.

I am inclined to regard the "2 per cent. for cones" as a concession by the seller to the buyer and near enough for most purposes, but until there is a standard weight for cones and less variations in wrapping, "2 per cent. for cones" cannot be considered as based on actual facts.

The preceding figures show that large cones are an advantage to the buyer in the matter of tare. They are also an advantage when knitting, especially on coarse counts, unless the yarn stands of the knitting frames prohibit their use. Large cones mean less refilling of yarn stands, and less waste, other things being equal, because there are less cones to strip as well as less attention and work being required of the operator, which allows of better cloth and more of it.

There is also some waste made by the knitting machine operators when tying knots, and by the lint that flies from the yarn. If the yarn is properly spun and carefully coned, I find that both these items are so small, under careful management, as to be hardly worth noticing. The lint shows quite conspicuously about the room, but it is a very small item on the scales, and when one considers that it is the poorest part of the yarn it seems much better to devote one's attention to larger matters.

The five cotton-buying countries of Europe in the order of their takings are Great Britain, Germany, France, Italy and Russia.

For the twelve months of 1904 there were imported into the United States 186,572,683 pounds of wool valued at $29,355,344. In the same period there were also entered woolen manufactured articles, carpets, clothing, cloths, etc., to the value of $16,131,785.

DIFFICULTIES IN THE MANUFACTURE OF HIGH GRADE UNDERWEAR.

BY WABASH.

In the manufacture of high grade underwear there are various difficulties that do not occur in the cheaper grades, such, for instance, as making the goods of an equal length and average weight. After a satisfactory sample has been made a record should be taken of the kind of wool used in the mixture, and the amounts of each, and on no account should a change be made so long as that style is being run. The work in the mixing room should not get too far ahead of the card room, or the emulsion will dry out of the wool and result in heavy and uneven work.

The work rooms should be kept at as even a temperature as possible; 75 degrees F. is not too high for all the rooms in a high grade mill. Never let it go below 55 degrees at night and it should be at 75 by starting time. A good deal of bad work can be traced to cold rooms in the morning.

The cards should be cleaned at regular intervals and the roving weighed frequently, care being taken that the top and bottom spools are the same weight. The yarn should also be weighed every set when the bobbins are about half full. The usual way is to weigh half top and half bottom spools together, and if the total is all right let it go at that. A better plan is to weigh the spools separately and report any variation to the carder.

It is also important that close attention should be given to the length of the stitch. The measuring should be done at regular intervals, care being taken to have the take-ups of the machines at a perfectly even tension. The temperature of the room should also be at the right point as the yarn will run in more freely when the room is warm.

A good many knitters have contracted the habit of letting all the bobbins run out at the same time. This will sometimes cause uneven work, as there is much more friction on the yarn when the bobbin is nearly empty than when it is full. It is better to have half of them run out together.

The worst thing to contend with, however, is the take-up. It is responsible for more uneven weights than any other thing. I have sometimes seen a difference of an inch and a half between the top and bottom of a roll. The reason is plain: when the roll is started it is slack and rolls up light, and as it gets heavier it rolls tighter, stretching the stitch lengthways. To remedy this the cloth should be rewound on a cloth turning machine. This puts the top of the roll at the bottom, and after a little practice the cloth can be turned perfectly even. The cloth should be turned as soon as it is taken off the machine, especially if the yarn was wet before knitting, in which case the rolls should have time to dry before cutting and the cloth kept tightly rolled.

Another place where variation in length is often caused is the looping table. Some time ago I was called to help investigate a trouble of this kind in an underwear mill. The goods varied from one to two inches in length and of course the short ones were too light. I began at the card room; everything was all right. The spinning room was all right, the knitting room was all right except for the variation in the width of the rolls, and to this defect was traced most of the variation in weight. In the cutting room everything seemed to be all right, but the looping machines were badly out of order, and as a consequence odd garments had to be relooped, which of course made them shorter. The room was not well run, either, which added to the trouble. After the cloth was rewound and the loopers put in order the trouble disappeared.

The wash room is another place where trouble can easily be caused by a little neglect. As a rule fine goods take very little fulling, and a minute more or less will sometimes make a great difference. The boarding and drying may and do cause the same trouble if they are not carefully watched. It is a good plan to have the drying boards marked so the boarders can have something for a guide. Cold drying is always best, but if heat is used the dry room should never get over 120 degrees F. The goods should be taken out as soon as they are dry, otherwise they will have a harsh feel and a tendency to shrink.

Variations in goods are also caused by a sudden change in the weather from extreme dry to extreme wet. Some allowance should be made for absorption, as goods made during wet weather gather moisture and weigh heavy until dried. On the other hand, goods made in extremely dry weather should be kept on the light side. It is a good plan not to change the weight of the yarn, the stitch or the cutting length when goods are running uneven, until the cause of the trouble is certain.

KNITTING BLACK WORSTED YARN.

I note in your July issue the difficulty of your correspondent in knitting black worsted yarn, and the remedies suggested by other correspondents. I think a suitable emulsion can be used to advantage that will not stain the boxes like oil, for boiling the emulsion saponifies the oil in it. The emulsion that I have used is made of two pounds of Bradford soap, to which is added one and one-half pints of softening oil, and then sufficient water to fill a three-quart pail, and boiled.

To use this on the winder a galvanized iron trough is made and on this placed a tin roller about three or four inches in diameter, which is revolved slowly by the yarn which runs over this roller as it passes from the skein, cop or tube to the bobbin of the winder. The roll revolves in the trough, which is filled with emulsion, and the yarn passing over the roller absorbs what seems to be the right amount of emulsion.

There is always more or less trouble in knitting dyed black yarn in both cotton and worsted. When it is possible manufacturers generally use the yarn in the gray or white and then dye the knitted fabric afterward, but in knitting sweaters or hosiery where more than one color is used, of course the yarn has to be dyed first. I have found that the emulsion works very well on harsh and hard twisted yarns, such as lisle thread two-ply, which if not run through the emulsion would not knit without making many holes.

LAFAYETTE.

A HOSIERY KNITTING MACHINE.

This machine, recently patented in the United States, is built for the production of seamless hosiery in colors with white soles, or having the sole of the foot of a different color from the upper portion of the foot and leg. Fig. 1 is a longitudinal section of the new machine; Fig. 2, a plan of the cam rings; Fig. 3, a section taken on the line, ×, Fig. 2; Figs. 4 and 5, enlarged views of the cam rings, showing the needles in different positions.

The needles are of the ordinary construction, but of two lengths as shown. The short needles are for knitting the sole; the long needles, for the upper. The long needles may be used for both sole and upper, if desired.

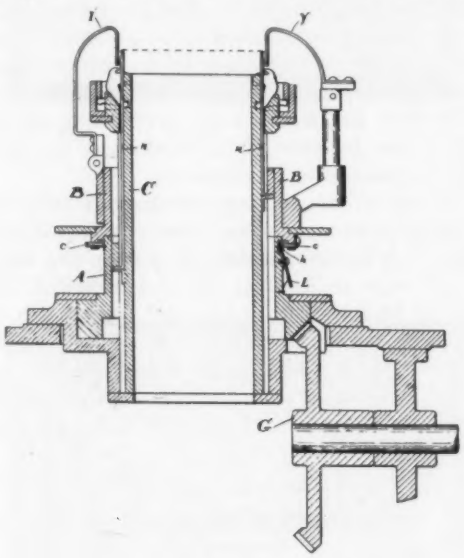


FIG. 1.

The two series of needles overlap each other so that the long series begins and ends with a short needle; the short series has a long needle at each end. This overlapping causes the web for the upper and the web for the sole of the stocking to be joined in one. If preferred, the two series of needles may overlap two needles at each side instead of one, which will cause a joint or seam of a slightly different appearance along the side of the foot of the stocking, and this seam may be varied in other ways which will readily suggest themselves.

The following description of the operations for making a black stocking with white sole will make clear to the reader the general operation of the machine on all kinds of

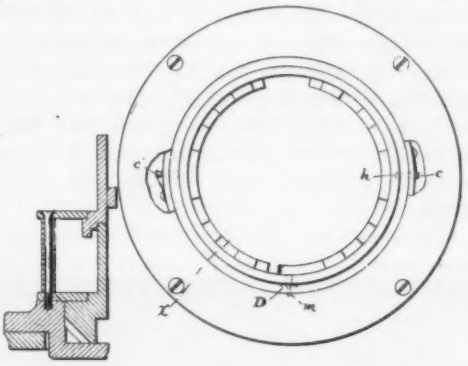


FIG. 2.

FIG. 3.

goods. The cam-ring, B, being in the position illustrated in Fig. 5, with the two sets of needle-cams on the same side, one above the other—that is, one hundred and eighty degrees from the position shown in Fig. 1—the black yarn is led to the needles through the yarn-carrier, Y′, and the machine is run with a continuous rotary motion, knitting a continuous seamless tubular leg in all respects in the ordinary manner of other automatic knitting-machines of the circular form, except that the upper set of cams, e, operate the short needles on one side and the lower set of cams, f, operate the long needles on the other side, the operation of the needles, however, being perfectly continuous, as in ordinary knitting.

When the leg is finished, the machine is stopped by the usual mechanism. The handle, m, and arm, D, are now pushed to the left, depressing the point of the cam, K, and the machine given one turn to throw up the long needles out of operative position. Then the lower end of the lever, L, is pushed in, throwing the bolt, c, out of the recess, h, when, the upper cam-ring, B, being held by hand, a turn of the driving-gear will rotate the lower cam-ring, A, through an angle of one hundred and eighty degrees until the bolt, c′, drops into the recess, h, and the cam-rings are in the relative position shown in Figs. 1, 2 and 4, and firmly locked together.

If preferred, the driving-gear, G, and cam-

ring, B, may remain stationary and the cam-ring, A, rotated one hundred and eighty degrees, but the method of reversing the cam-rings above described is found to be the most convenient. The black yarn is now broken off and the white yarn inserted in the yarn-carrier, Y′, and the machine started again, this time with a reciprocating motion, and allowed to knit the heel, using only the short needles, n′, in the ordinary manner, dropping and picking up needles by its automatic mechanism.

When the heel is finished, the machine stops again. The arm, D, is now pushed to

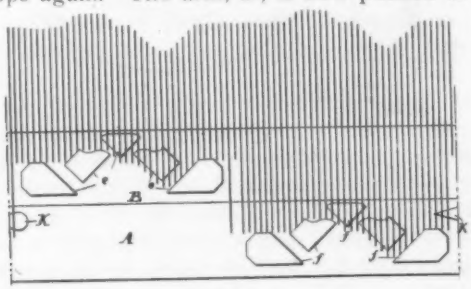


FIG. 4.

the right, raising the point of the cam, K, and one turn of the machine forces down again the long needles into operative position. The black yarn is then inserted in yarn-carrier, Y, the white yarn still remaining in yarn-carrier, Y′. The machine is again started and continues its reciprocating motion, as in knitting the heel, but now dropping no needles, and the entire number of both sets of needles knit-

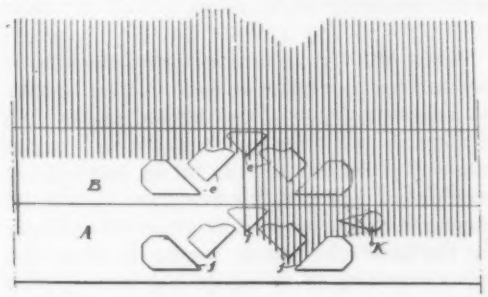


FIG. 5.

ting each with its own yarn, the lower set of cams operating the long needles with the black yarn on one side of the cylinder, and the upper set of cams simultaneousiy operating the short needles with the white yarn on the other side of the cylinder.

At either side, owing to the overlap of the two series of needles, as above described, a stitch of the white yarn will be omitted and a stitch of the black yarn made in its place, and a stitch of the black yarn will also be omitted and a stitch of the white yarn made in its place, thus causing the two webs to be interlooped and firmly joined together, although being in construction, feel, and, but for color, in appearance almost exactly similar to a single continuous web without noticeable ridge or seam.

The toe is knitted in exactly the same manner as the heel. After the stocking is finished the cam-rings are brought back again to their first position for beginning another stocking. The changing of the yarns and the rotating of the cam-rings might readily be made automatic; but it is believed, on the whole, that the greatest production with the least trouble and least expense for repairs and loss by stoppage will be obtained by performing these operations by hand, to say nothing of the saving in cost of the machines.

As described, the improvement is adapted to what is known as the "three-quarter-automatic" knitting-machine, in which the machine stops of itself at the end of each successive knitting of the leg, heel, foot, and toe. When a full-automatic machine is used, it will have to be equipped with a stop-motion to cause it to stop at these points in order to make the described changes in relative position of the two cam-rings.

DROPPED STITCHES.

Editor Textile World Record:

In knitting Richelieu rib 2 x 2, I am troubled with occasional drop stitches from the cylinder needles. How can the machine be adjusted to stop this trouble? When knitting lace stitch goods by the use of long latch dial needles I find that the cylinder needles just preceding the long latch needles are apt to drop stitches. The same machine will knit 2 x 2 perfectly.

Enclosed are three samples showing the defects.

No. 1. Richelieu rib. Notice that the drop occurs on the first needle of the six. This is nearly always the case.

No. 2. Richelieu rib. Notice that the drop occurs on the first needle of the pair on the 2 x 2 part.

No. 3. Lace stitch. Notice that the drop occurs on the cylinder needle just preceding the long latch needle in each case.

What is the remedy? Richelieu (478).

[This question appeared in the December issue. We have had several inquiries since of a similar nature and as we are unable to supply the back numbers, we reprint the answer.—Ed.]

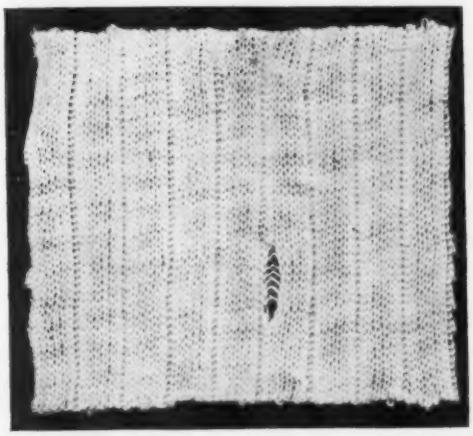


FIG. 1.

The drop stitches may be caused by needles which have poor hooks. When the cylinder needle starts to rise, after having drawn the loop, the stitch rolls off the front of the hook.

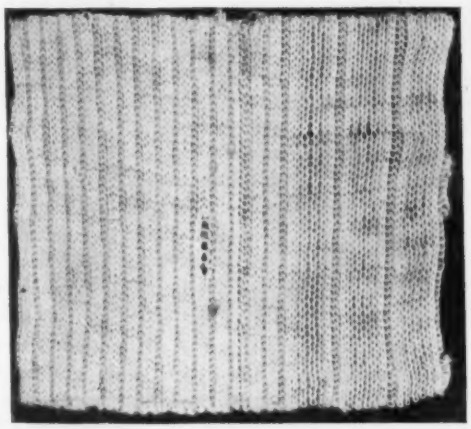


FIG. 2.

Again they may be caused by the hole of the yarn guide being a little too high, so that when the yarn is being fed to the cylinder needles on the angle, these particular needles which drop the stitches work freely in the slots, and the take-up not drawing very tightly on the cloth, the needles have a tendency to drop of their own accord instead of remaining up until drawn down by the stitch cam. This causes these particular needles to miss the yarn.

I infer, however, that Richelieu has doubtless tried different adjustments of the yarn guide without effect, but it may be possible that even when he has set the yarn guide down as low as the dial needles will permit him to do, the hole may still be too high to prevent the cylinder needles from engaging the yarn on their downward movement.

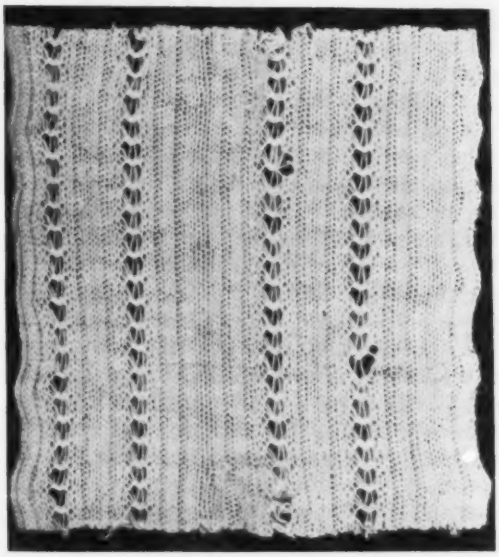


FIG. 3.

In changing the position of the hole in the yarn guide, care must be taken not to get it too low. If it is too low the end of the latches are liable to catch in it, resulting in bending them.

Again the drop stitches may be caused by the dial needles not drawing their stitches back at the right time. As soon as the cylinder needles start to rise, the dial needles should start to draw back, so as to keep the newly formed loop tight on the cylinder needle, and thus prevent it from rolling over the hook of the cylinder needle, as the pull from the take-up on the loops is greater on the dial needles.

From a close examination of samples

Nos. 1 and 2 I am of the opinion that this latter cause is the real one in this case. If so, the remedy for this is to set the dial to draw the needles a little earlier; if this cannot be done without throwing out the proper adjustment of the yarn guide in respect to the dial needles, then the cylinder needle cams should be fixed so the needles will be held down a trifle longer before beginning to rise.

Regarding the lace stitch sample No. 3, as the drop stitch is always from the needle preceding the long latch needle, which accumulates 4 courses of yarn every time before knitting, I think that this accumulation of courses is primarily the cause of the dropping.

The long latch needle in holding its stitch while 4 courses of loops are being knit on the other needles, it follows that the whole pull of the take-up is entirely on the long latch needle stitches, so that the loops in between the long latch needle stitches are lying loosely on the needles, the loop just preceding the long latch needle being more so than those preceding it. The cylinder needle thus rises and the loop rolls over the hook, for it will be noted in this sample, No. 3, that the drop stitch is the one after the fourth course, or when making the fifth course, which is when this preceding loop is loosest on the needle.

It may be asked why does not the loop immediately succeeding the long latch needle drop also, but this is answered by the fact that as quickly as the long latch needle forms its loop on the fifth course, it drops the accumulated previous four courses, and the pull of the take-up is immediately transferred to the succeeding loops, and prevents them from dropping.

The remedy for this is either to have the cylinder lower cam made so that just as soon as the needle has drawn its loop (by passing under the stitch cam) it should rise as quickly as possible, or make the cam so as to hold the stitch down until the succeeding ones have made their loops, and the take-up has had an opportunity to pull upon them, and thus prevent them rolling off the hook, which they are liable to do, if not held down a sufficient length of time or if the cylinder needles ascend too slowly.

If these remedies do not enable Richelieu to overcome the difficulty and if he will state what he has already tried without effect, we may be able to offer further suggestions that will help him. LAFAYETTE.

SINGLE PLUSH KNITTING.

BY F. W. HERINGTON.

Single plush knitting, as made on spring needle circular machines, consists of one thread on the face, and the backing thread. Only one sinker burr, therefore, is needed, and while double plush knitting requires an additional landing wheel and needle presser, in order to carry up the backing thread prior to the putting in of the second face thread by the second sinker burr, they are not required in making single plush, as the landing wheel and needle presser which presses off the loops of the face can at the same time press off the backing thread, and carry both up together.

Fig. 94 is an enlarged sketch of the loops on the face of single plush, A being the face thread; the black line, C, representing the backing thread; D D, the point of contact of the backing thread with the face thread, A, showing how the face thread stitches the backing thread.

From a close examination of the points of contact, D D, it will be seen the backing thread does not form a loop or stitch, but being crossed by face thread, A, is bound by it, and where not so bound lies loosely at the back of the face loops. As shown in Fig. 94, the backing thread is bound at every third loop.

The backing thread, represented by the black line, C, Fig. 94, at the point of contact, D D, with the face thread, A, is between the loops of the face of the fabric, and when, as is usually the case, the backing thread is a heavier or coarser thread, it will be forced through and will show through the wales of the knitted loops of the face, and therefore the face of single plush will not present a smooth face, as in plain knitting, or as in the double plush.

Fig. 94 also shows the backing thread, C, at the point of contact with the face thread, A, at each separate row of loops, as being

bound, one loop to the left of the loop of each previous course.

This is done by having an odd number of needles in the cylinder, or a number divisible by 3 and a remainder of 1 or 2.

If the needles are divisible by 3 without any remainder, then the stitchers of backing thread would lie directly under each other in a vertical line. If the backing thread was forced through the wales of the face, vertical stripes would appear on the face at every third needle. If a different colored thread were used for the backing thread, vertical stripes in colors on the face would be produced.

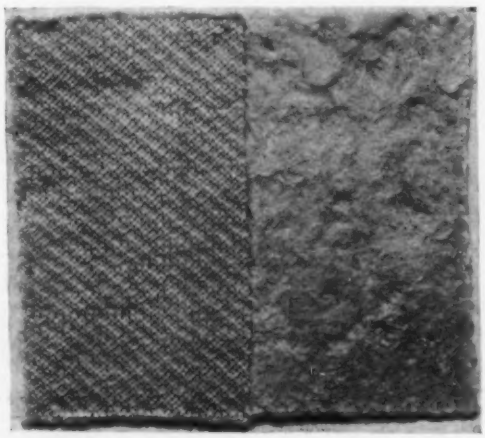


FIG. 95.

Fig. 79, April, 1904, issue Textile World Record, page 143, shows the arrangement of the burrs, wheels and stands for making single plush on a spring needle circular machine.

Fig. 95 is an illustration of single plush on the face of the fabric, the back being the same as in double plush. Single plush is used for men's underwear, but is not very popular.

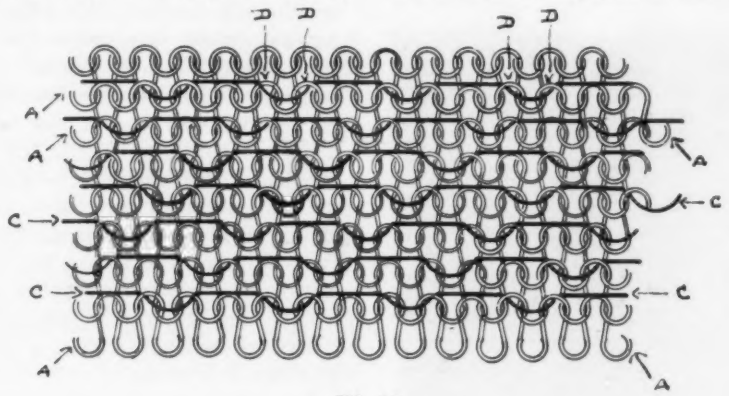


FIG. 94.

and is only used in very cheap lines. It is also used for linings for gloves and rubber overshoes. Single plush knitting is also what is known as eiderdown cloth, which is used in the manufacture of children's jackets, robes, etc. The double and single plush is also used in making imitation buffalo robes, as many as five backing threads, fed by five backing burrs in rotation to one feed being used, which produces a very heavy plush back. In buffalo robes, glove linings, linings for overshoes, and eiderdown cloth, the back of the fabric after being napped or fleeced to produce the plush effect, becomes the face or front of the fabric, and is used as such.

The tuck stitch can be combined with either single or double plush. Fig. 96 is an illustration of tuck stitch on the face of double plush, the back of this cloth being the same as Fig. 92. It is 2-and-2 tuck stitch for 12 stitches and then plain stitch for 12 stitches, which is repeated.

This construction requires at least two feeds on the machine, but can be also made with a multiple of two feeds, as four, six, or eight feeds. Two revolving needle pressers are required for two feeds on the machine, both of which must be cut alike.

Fig. 97 is a drawing of a cut needle

presser, looking down upon it. G is the tuck stitches; H, H', plain stitches.

The pressers are cut so as to skip two needles, Fig. 97 G, and then to press the next two needles, Fig. 97 H, 1. This is repeated three times or twelve needles in all. The

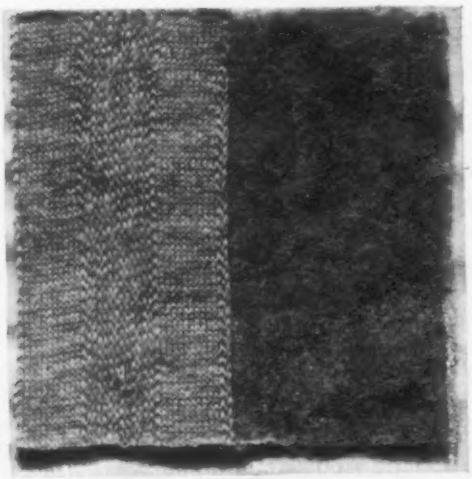


FIG. 96.

next twelve needles are pressed in succession, Fig. 97 H, which are the plain stitches, following the combination of two tuck stitches and then two plain stitches repeated three times.

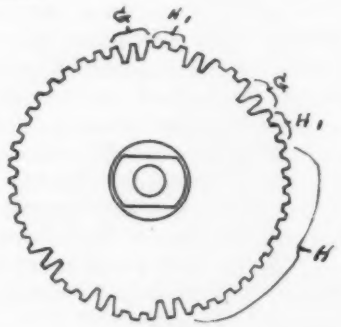


FIG. 97.

The second needle presser is set so as to press the first two needles which the first needle presser did not press. As there are 12 tuck and plain stitches combined, and 12 plain stitches following, which are repeated on the needle presser, Fig. 97, or 24 stitches in all, the number of the needles in the cylinder must be divisible by 24 without a remainder. The number of cuts in the needle pressers must also be divisible by 24 without a remainder.

If after dividing the needles by 24 there was a remainder of either 2 or 22, which would be 2 needles more or 2 needles less, the tuck pattern on the face, instead of showing vertical stripes of tuck stitches, with alternate stripes of plain stitches, would run diagonally across the face of the fabric, and the diagonal would be to the left or right, according as the remainder was 2 or 22.

If two different colored threads were used in this pattern, the tuck stitches would show vertical stripes of two stitches, with the colors alternating, while the plain stitches would show horizontal rows of the different colors, or what is called a "pin stripe" in plain stitch knitting.

This fabric can be made in the same manner without a backing thread, and with a single face thread, and it would then be a fabric composed of the tuck stitch with the plain stitch similar to Fig. 25.—February, 1903, issue Textile World, page 293.

UNSHRINKABLE KNIT GOODS.

Editor Textile World Record:

Nearly 75 per cent. of the worsted knit goods sold in Canada are imported from England and Germany and all are labeled, "Guaranteed non-shrinkable. All wool." Retailers tell me that they absolutely guarantee this and if the garment shrinks in washing the manufacturer protects them and will replace it. This being so, I am confident that they use some process, preparation or compound in the first scouring of the goods which renders them unshrinkable in after washings. I learn from English correspondents that the process is a trade secret, but as I have had offers from parties to sell the formula I would like to know whether the process is generally used in this country. Burton (575).

We understand that quite a number of manufacturers are using a process of this description. The only one that we know of is that of Chas. H. Heyer. In some of the foreign publications we have seen formulas which were said to render wool goods unshrinkable. The chlorination of wool destroys a large part of its felting properties and therefore makes it less liable to shrink in washing. A thesis on this subject was written in competition for the Textile World

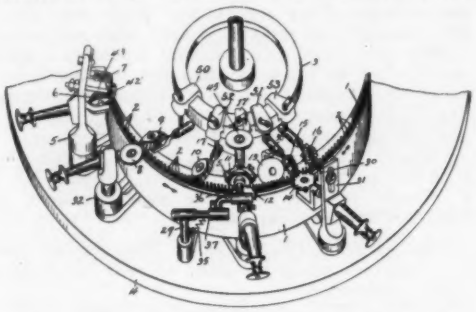
Record's gold medal at the Philadelphia Textile School this year and will be republished in the Textile World Record, probably in the September issue. The subject is one that is attracting a good deal of interest in this country and abroad. If, as our correspondent states, the majority of the knit goods sold in Canada are warranted unshrinkable, it seems as if it would not be long before the trade in this country would demand a similar guarantee.

Recent Knitting Patents.

KNITTING MACHINE, Stitch Transferring Mechanism for. 793,913. Martin J. Shaughnessy, Amsterdam, N. Y.

This invention relates principally to means for transferring stitches from one needle to another in knitting pattern fabrics and its principal object is to facilitate the knitting of these fabrics on circular-knitting machines by means of transferred stitches.

The invention is applicable to various styles of spring-needle knitting-machines, and in its preferred form is especially adapted for use in connection with spring-needle circular-knitting machines, and particularly that style in which the needles are mounted in what is known as a trick-



cylinder—that is, a cylinder provided with grooves within which the needles are respectively located and clamped instead of being mounted in leads.

The drawing is a view in perspective of a portion of a circular-knitting machine, showing the improved stitch-transferring mechanism applied thereto.

KNITTING MACHINE. 794,963. George D. Whitcomb, Glendora, Cal., and William C. Whitcomb and Elihu Lippitt, Chicago, Ill., assignors to George D. Whitcomb & Co.

KNITTING MACHINE. 793,791. Josiah Johnson, Leicester, England.

KNITTING MACHINE Needle Cap. 793,556. Amos G. Wilson, Elmira and Ernest Tompkins, Troy, N. Y., assignors to Tompkins Bros., Troy, N. Y.

KNITTING MACHINE Needle Holder. 795,179. Ernest Tompkins, Troy, N. Y., assignor of one-half to Frederick W. J. McKibbin, Troy, N. Y.

KNITTING MACHINE Pattern Mechanism. 794,474. Frank B. Wildman, Norristown, Pa.

KNITTING MACHINES Pattern Mechanism. 794,475. Frank B. Wildman and Evarts G. Loomis, Norristown, Pa.

KNITTING MACHINES, Thread Changing Mechanism for Circular. 794,407. Emil A. Hirner, Allentown, Pa.

STOCKING FOLDING BOARD. 794,106. Charles H. F. Keene, Philadelphia, Pa., assignor to Rosenau and Loeb.

KNITTING MILL NEWS.

New Mills.

*Georgia, Augusta. Contract has been awarded for erection of new buildings for the Topsey Hosiery Mills. The main mill will be 50 by 60 feet, two stories; the dye house, 50 by 75 feet, one story; and warehouse, 100 by 25 feet, one story. Electricity will be the motive power. Plant will be equipped with 85 knitting, 40 ribbing and 25 looping machines, for making men's, ladies' and children's hosiery.

*New Jersey, Vineland. Operations will be started about August 1st, by the Karl & Levey Hosiery Company, recently incorporated with capital stock of $50,000. S. J. Levey is president of the company and J. Karl, agent. They will make ladies', men's and infants' cotton hosiery, operating 65 knitting and one sewing machine. Goods will be sold direct and through Condit & Arnold, Indianapolis. An old building has been secured and is being renovated. They will build a new boiler house.

*North Carolina, Albermarle. Contract has been let for erection of the new buildings for the Lillian Knitting Mills. The main building will be 100 by 50 feet, and dye house, 30 by 60 feet.

*North Carolina, Hillsboro. The new plant of the Bellevue Manufacturing company has been completed. Thev have an equipment of 2,500 spindles. 25 footers and 30 ribbers, and will dye and finish goods. Additional machinery will be installed as business warrants.

*Tennessee, Cleveland. Work will start August 1st on erection of new buildings for the Cleveland Hosiery Mills, authorized capital, $50,000 ($35,000 paid in). They will make misses' hose, operating 125 knitting machines. G. L. Hardwick is president of the company and C. H. Weiss, treasurer and superintendent.

Tennessee, Rockwood. A new knitting mill is to be started here by Garnett Andrews and associates, with capital stock of $40,000. About 150 people will be employed.

Enlargements and Improvements.

Alabama, Huntsville. The W. H. Rowe Knitting Company proposes enlarging the mill by installing additional machinery.

*Alabama, Talladega. Work has been started on erection of new mill for the Selocta Hosiery Mills, formerly known as the Highland Hosiery Mills.

Illinois, Chicago. It is reported that the Paramount Knitting Company will expend several thousand dollars in new machinery to be installed in their plant at Kankakee.

Massachusetts, Northampton. Contract for building addition to the McCallum Hosiery Mill has been let to Avon Matthews.

New Hampshire, Hillsboro Bridge. Work is nearing completion of a new storehouse, 120 by 40 feet, for the Contoocook Mills, manufacturers of hosiery.

New Jersey, Dover. Paul Guenther, who is operating quite a number of full fashioned machines on ladies' silk hosiery, which he is selling direct, is enlarging his factory by 120 feet and will completely double its capacity. He is very busy.

North Carolina, Durham. Contract has been let by the Durham Hosiery Mills for erection of a new building, 150 by 50 feet, 3 stories high, for finishing.

*Ohio, Cleveland. The Friedman, Blau, Farber Company will start work August 1st on erection of new buildings. One building will be four stories and basement, 120 by 200 feet, and the other, part two and part one story, 147 by 55 feet. They expect to have same completed and ready for operation January 1st. This concern manufactures all kinds knit goods, operating 215 knitting and 100 sewing machines. Product is sold direct.

Ohio, Piqua. The Atlas Underwear Company will erect an addition to its plant.

*Ontario, Clinton. Work will start at once on erection of new mill for the Clinton Knitting Co., Ltd. Men's half hose, women's and children's hose are made. When completed, the company will have total of about 60 knitting machines.

Pennsylvania, Chambersburg. It is reported that the Chambersburg Hosiery Company contemplates erecting a new mill building and doubling present capacity.

*Pennsylvania, Greencastle. Work has been started on the superstructure of the Windsor Knitting Mills' new building and will be pushed to completion.

Pennsylvania, Langhorne. The new stone building, 180 by 40 feet, one story and basement, which is being built for Rumpf & Scheer, manufacturers of full fashioned silk hosiery at Coral and Firth Sts., Philadelphia, is now almost completed and will be ready for occupancy during the middle of August. The building will be equipped with new full fashion machines which they now have stored in that town.

Pennsylvania, Macungie. A new mill is to be erected for John Rems & Sons, manufacturers of underwear.

Pennsylvania, Milton. The West Branch Hosiery Company is reported to erect a new dye house.

*Pennsylvania, Newport. The new addition to the hosiery mill has been completed.

Pennsylvania, Orwigsburg. The boiler house of the Orwigsburg Knitting Mill is being enlarged. A new 40 h. p. boiler is to be installed.

Pennsylvania, Philadelphia. The Carvin Knitting Co., now at Mascher and York Sts., will remove its plant, during the month of August, to Lomax's new mill, which is now being erected at Jasper and Cambria Sts., where they will be able to increase their facilities in the way of adding new machines, etc. They are manufacturing women's and misses' fine fashioned and seamless hosiery on 160 spring needle and 88 latch needle knitters and have placed an order for 30 new National machines which they will operate on lace work. The plant, which is under the supervision of Jos. J. Carvin, Jr., who is also the buyer, is very busy.

Pennsylvania, Philadelphia. The Roosevelt Worsted Mills at 2023 Naudain Street are very busy operating 3,456 spindles, 3 cards and 2 combs on knitting and weaving yarns up to 36's. The officers of the company are Curt A. Loewel, president; William Deacon, treasurer and superintendent, and Fritz Quittner, manager and buyer. The concern has recently taken over the entire building, five stories high, in which they are located and have removed their offices to an adjoining, but smaller building, connected with the factory. The production is sold direct.

*Pennsylvania, Philadelphia. The Liberty Bell Hosiery Mills, 4318 Frankford Avenue, which was recently incorporated with a capital of $25,000, is re-equipping its plant with entire machinery throughout. They are putting in 100 new Hemphill machines for making ladies' high spliced and double sole hose and National machines for lace work; also 20 more knitters for making infants' hose, the goods being sold direct and through D. C. Dalsimer, New York. Among the other changes they mention that Mr. Ernest Aucott, the secretary of the company, is no longer connected with the concern, having recently retired. Mr. E. C. Locke is now the sole superintendent and buyer. They are very busy.

Pennsylvania, Phoenixville. Parsons & Baker have started removing plant to new building recently completed.

Pennsylvania, Pittston. E. L. Ellithorpe & Sons, proprietors of the Luzerne Knitting Mills, have purchased additional property upon which they will erect a brick warehouse.

Pennsylvania, Reading. G. G. Guenther, now located at 762 Penn Street, has purchased a large three-story building at 946 Court Street and will make addition of one story to the plant and other improvements, previous to removing to same. New machinery will also be installed.

Pennsylvania, Schuylkill Haven. Reed & Leininger, proprietors of the Union Knitting Mills, are installing a new 60 h. p. boiler in the plant, and will also put in a 50 h. p. engine.

*Rhode Island, Thornton. Work on the new addition to the Samuel Fitch Manufacturing Company's plant is nearly completed.

South Carolina, Spartanburg. The Crescent Manufacturing Company is contracting for 40

more latch needle machines, to be installed in the plant at once. This will give the company a total of 140 machines making boys', misses' and children's ribbed hose. They are also adding double knee motions to the machines for purpose of making double knees on boys' 2 by 1 heavy weights. They have recently doubled the dye plant and will add additional dye house machinery. Hugh F. Little is secretary and manager of the plant.

Mills Starting Up.

Massachusetts, Highlandville. The knitting mills of the William Carter Company, John F. Brooks Company, Moseley & Co., Roper Bros. & Co. and James B. Thorpe, which have been closed for their annual vacation and repairs, have resumed operations. William H. Wye & Co. and Geo. E. Wye & Co. of Needham have also resumed work in their mills.

*New York, Stittville. Operations have been resumed in the Empire Knitting Mills, which have been closed for purpose of making repairs and improvements.

Mills Shutting Down.

Massachusetts, Farley. The Orange Knitting Company has been closed for a three weeks' vacation.

New York, Waterford. The Kavanaugh Knitting Co.'s mill will close August 5th for two weeks.

West Virginia, Martinsburg. The Kilburn Knitting Mills, which have been idle for the past five weeks, have been closed for an indefinite time. Differences with the operatives has caused shut down.

Facts and Gossip.

Illinois, Chicago. The Eastern Knitting Mills Company has been incorporated with capital stock of $15,000 by M. I. Apfelbaum, John Corn and David Apfelbaum.

*Massachusetts, Lowell. Work is progressing rapidly on the new mill for the Appleton Company. The masons are now at work on the second story.

*New Hampshire, Ashland. Work has been completed on installation of the new boiler in the Ashland Knitting Co.'s mill.

New York, Cohoes. It is reported that a new concern is to be located in the Benson Building, manufacturing knit goods. Operations will start about September 1st.

New York, Elmira. The Elmira Knitting Mills have been damaged by the overflow of river near by, the lower floors of the building being flooded.

New York, Johnstown. A meeting of the stockholders of the Johnstown Knitting Co. will be held August 21st, at which time it will be recommended that the company's affairs be liquidated and the present business discontinued. The plant will probably be continued the remainder of the year.

*New York, Little Falls. The Rex Knitting Company, capitalized at $40,000, operates 7 sets cards, 30 knitting and 10 sewing machines on sweaters. Frank Senior is president of the company and E. I. Stinson, treasurer. A dye house is attached to the plant. Goods are sold direct and through Webb & Alford, New York.

New York, Mechanicville. The plant of the Knickerbocker Hosiery Mills, which have been idle for some time, have been sold to the W. F. Greene Company.

Pennsylvania, Lyons. The American Knitting Mills, now operated as a joint partnership, will be incorporated with capital stock of $25,000. The plant will be enlarged.

Pennsylvania, Philadelphia. The Carlton Knitting Co., manufacturers of tams and toques on 12 knitters and 10 sewing machines at 23d and Hamilton Streets, have applied for a charter under the same name, with the following parties named as incorporators: Enoch S. Rogers, now the proprietor of the establishment, E. A. Gullett, Alfred Powell and Albert W. Hess, the superintendent of the plant.

Pennsylvania, Richland Station. The Richland Knitting Company has been dissolved. The company's plant is now being operated by Albert Haak.

Personals.

Arthur E. Remington has severed his connection with the Remington-Hayes Knitting Co., Grand Rapids, Mich., of which he was secretary, and has gone into the retail furnishing goods and clothing business, at Petoskey, Mich.

Philip Powell of Stillwater, N. Y., has left for Scranton, Pa., where he has accepted the position of foreman of the cutting room of a knitting mill.

R. M. Dublin has resigned as superintendent of the Bowling Green, S. C., Knitting Mills, and is succeeded by W. B. Flanagan.

Joseph Bell, manager of the Columbus (Miss.) Hosiery Mills, was fatally shot recently.

C. H. Whitcher of Ipswich, Mass., has accepted the position of superintendent for the Peerless Underwear Co., Mattapan, Mass.

E. G. Talbert, boss dyer for the British Hosiery Co., Thornton, R. I., the past nine years, has resigned.

Bruno Bonit, formerly of Dover, N. H., has accepted a position in the knitting mill at Northampton, Mass.

James Barrington, who has been secondhand in the dyeing department of the Knitted Fabric Co., Methuen, Mass., has accepted a boss dver's position for a firm in New York.

A decision has been made against the Government of the United States in a case involving hosiery and underwear clippings. The appraisers assessed duties upon the invoice as wool waste at 20 cents per pound. The importers protested, claiming it was wool rags and dutiable only at 10 cents per pound, and the claim was sustained by the United States Court of Appeals.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Automatic Clutch. The Automatic Clutch Co., Akron, Ohio, are placing on the market a new self-adjusting clutch which embodies a number of improvements. It is claimed to be quite different from others in principle, is simple and compact, loads automatically with the load and cannot slip when engaged and is self-adjusting until worn out.

New Indigo Process. C. H. Howard, Boston, Mass., is introducing into this country a process of dyeing indigo which has been discovered by A. W. Playne, Stroud, England. It is in successful use in several English dyehouses and is described in another part of this issue.

New Cylinder for Heilmann Comb. Meyer & Perrin, Paris, France. A novel cylinder for the Heilmann comb. Only a part of the needle surface is covered wih fixed needles, the other part having a series of porcupine rollers arranged like those in a cloth napper. Means are provided for revolving these rollers in either direction so that the speed of the needles in the rollers can be made either higher or lower than the speed of the fixed needles of the cylinders.

Spindle for Jute and Flax. Oskar Schimmel & Co., Chemnitz, Germany, are placing on the market an improved spindle for spinning hemp, flax and jute, the invention of C. Bergmann at Meissen.

Jacquard Machine. C. M. Auerbach, Chemnitz, Germany. An improved jacquard motion for weaving double plush.

Shuttle Box. Oberholzer & Busch, Zurich, Switzerland. An improved shuttle box for fast running looms. This device was invented in France by J. Laforet & Co., and is said to be very efficient under varying conditions of speed.

Section Warper. Gebruder Sucker, Grunberg, Germany, has recently brought out an attachment for adjusting the sections of a sectional warper by which the yarn is wound on each section in the same relative position, thus preventing section marks.

Dyeing Machine. Bernhard Cohnen, Grevenbroich, Germany. A dyeing machine for cops, spools, loose stock, etc. It is said to be capable of a large production and to occupy very little room.

Shuttle Spindle. Gustav Preissler, Pabianice, Russia, has recently brought out an improved shuttle spindle designed to prevent the displacement of the bobbin during weaving.

Sponge Cloth Loom. Robert Hall & Sons, Bury, England. A loom for weaving sponge cloths in splits. A special winding machine is supplied with the loom which makes it possible for one weaver to run two looms where one was the limit formerly.

Warp Stop Motion. Cook & Co., Manchester, Eng., are introducing a new warp stop motion which is said to be very simple in construction and effective in operation.

Terry Loom. Hacking & Co., Bury, England. A loom for weaving terry cloth which is said to embody many improvements, among them being an automatic fringing motion. The builders claim that this loom will weave completely fringed and bordered towels at the rate of 176 picks per minute.

Mercerizing Machine. Luigi Cipollina, Rivarolo Ligure, Italy. An improved machine for mercerizing skein yarn embodying several improvements that increase the production as well as the quality of the work.

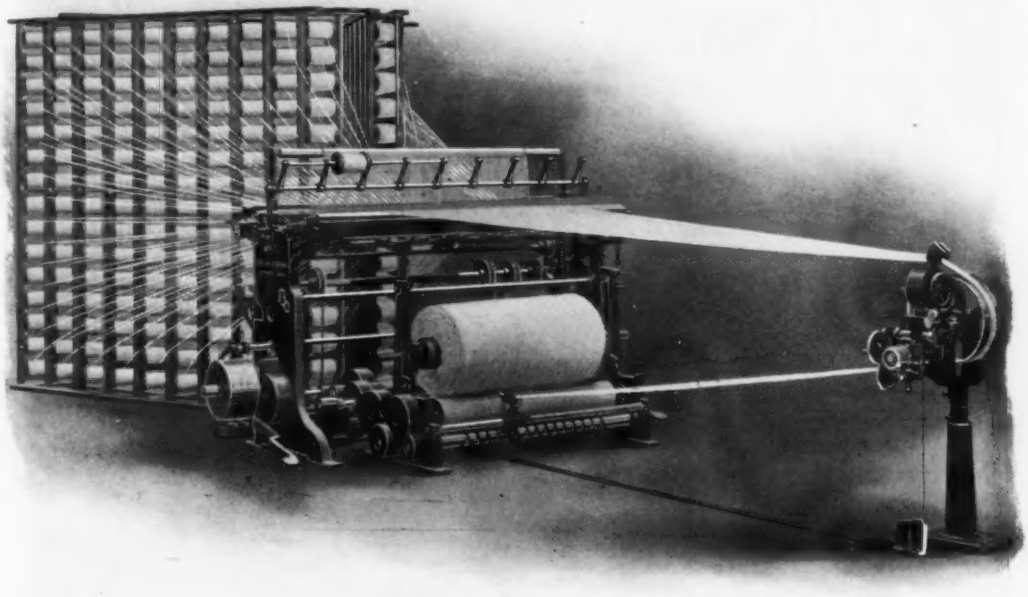
A NEW BALLING MACHINE.

The Draper Company of Hopedale, Mass., have recently made several important improvements in their balling machine. There are various methods of making chain warps, some mills preferring to make chains containing a large number of ends, the majority, however, using chains with 500 ends or less. No single machine will suit all methods. For a smaller number than 500 ends they recommend the balling machine.

The successful use of their four-ball warper led to the present improvements. The object of the warper was to save in waste, as it was difficult to measure four balls on four different machines accurately enough so all would run substantially alike. They have accomplished the result and ensured the accurate measuring of the chain by a much simpler method, measuring direct from the pulley. As the pulley is of large surface and has practically nothing to do except to guide the chain and rotate the indicator, there is little or no liability to slip.

The accompanying illustration shows the whole apparatus, the ball being wound on the separate rolls, which give large frictional driving power, and also shows the stopping connection from the pulley back to the machine.

The problem of measuring accurately has engaged the attention of the Draper Company for many years. With the ordinary warper their cylinder measuring system gives excellent results, but it is not advisable to wind balls direct from the cylinder to the warper as formerly, especially as heavier balls have come into use.



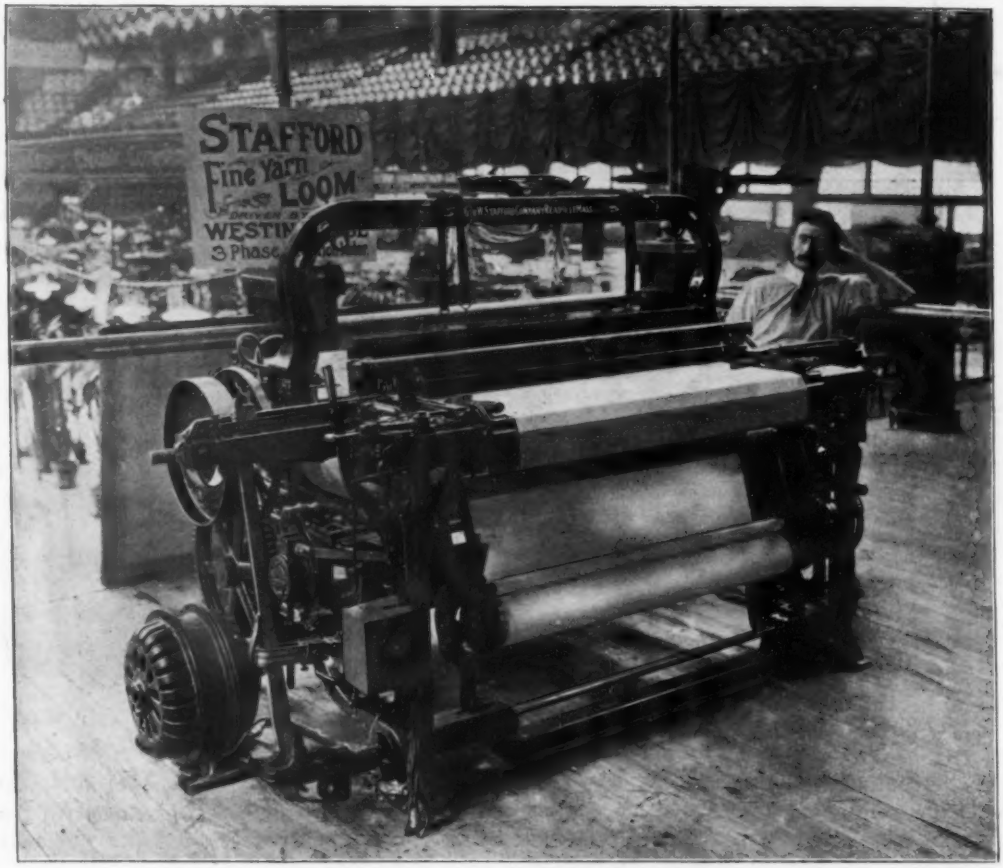
A DRAPER BALLING MACHINE.

Trade unions of some sort existed at an early day, for we read that in 1759 twenty-one worsted smallware weavers were sent to Lancaster "for combining against the manufactory," and a proclamation was issued in the same year declaring that combinations to raise wages were illegal, and that all who took part in them would be deprived of their employment and prosecuted.

A DIRECT CONNECTED ELECTRICALLY DRIVEN LOOM.

At the Electrical Exhibition held in Mechanics Hall, Boston, in connection with the annual meeting of the Electrical Contractors' Association, in July, there was shown in the Westinghouse Electric & Mfg. Co.'s exhibit along these lines with the view of thoroughly demonstrating the merits of the direct drive, believing that while it may not be adapted to all textile conditions, there are many places where it can be used to decided advantage.

The picture is from a photograph of the exhibit. The loom shown is a 40-inch plain



A DIRECT CONNECTED ELECTRICALLY DRIVEN LOOM.

a direct connected electrically driven cotton loom.

It will be remembered that at the last meeting of the New England Cotton Manufacturers' Association, M. H. Merrill, who has immediate supervision of the textile work of this company, presented a paper in which was set forth the development along the lines of direct connected machines. The Westinghouse Company has been working loom of the G. W. Stafford Manufacturing Co.'s make, 1905 model, weaving cloth 37 1/2 inches wide. The yarn was about 40s. The loom was equipped with the warp stop motion of the American Textile Appliances Co. The motor was a 1/4 H. P. 3-phase induction type, 200 volts. It made 660 revolutions per minute, and was geared down so that the loom was run at 190 picks. This was a solid loom, new and naturally some-

what stiff, and the motor started it at once on the first pick without taking hold of the lay. It ran very smoothly and with no variation of speed.

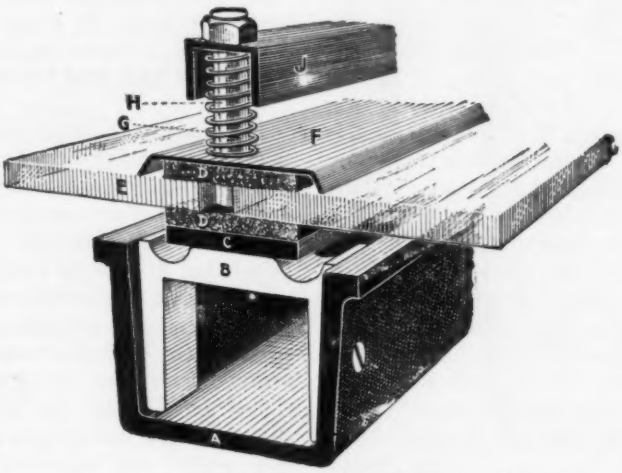
The warp stop motion is connected with the switch and when the thread breaks the switch is thrown off and the loom stops at once. A break in the filling thread also throws the switch and stops the loom.

A change in the speed of the loom is effected by changing the pinion on the motor, and the motor is fastened to the floor with a slotted base which permits it to be moved backward or forward to conform with the change in pinion gear, thus allowing all the range of speed that would be required.

The advantages in the way of uniform speed, maximum production, convenience in maintenance and repair, etc., that the electric drive has over the belt drive have already been set forth from time to time in these columns. The special interest in this installation lies in the direct connection. One objection to this method has previously been in the initial cost of installation, but we are informed that even in the brief time that has elapsed since the last meeting of the Cotton Manufacturers' Association, prices on this type of motor have been materially reduced, which makes the subject still more interesting to manufacturers. The exhibit was visited by a number of textile mill men.

THE "ANTI-PLUVIUS" SKYLIGHT.

A skylight is simply a skylight to most people, the average man thinking that one is about as good as another so long as it lets the light in and keeps the weather out. There is a great difference in skylights, however, and the ingenuity of inventors has been directed toward their improvement in these lines as well as toward other mechanical problems. The "Anti-Pluvius" skylight is one of the latest developments, being the invention of a German, the people who are noted for their thoroughness in detail and care in construction. Many very large installations have been made abroad under particularly severe conditions, and after careful tests the managers of the Prussian State Railway have specified this skylight for the new station at Hamburg, which is one of the largest in the world.



AN "ANTI-PLUVIUS" SKYLIGHT.

This "Anti-Pluvius" skylight is protected by United States patents and is now being made in this country by the G. Drouve Co., Bridgeport, Conn., manufacturers of skylights, cornices and the Lovell window operating device. A great advantage claimed for it is that it is permanently impervious against rain, snow, sleet and dust without the use of putty or cement. Every part is interchangeable and fits snugly. There is no formation of sweat on the iron

pieces, no dripping of condensation from the inside of the glass. This feature will particularly appeal to textile manufacturers, many of whom have experienced the annoyance of dropping from condensation, especially in dyehouses.

The construction of the "Anti-Pluvius" system of skylighting is as follows: The steel supporting bar, A, is U-shaped, giving a maximum of strength with a minimum of weight. The small wedge-shaped cast steel bridge fitting into the U-shaped bar carries the weight of the skylight, and for that reason fits firmly into the bar in such a way that its lower ends rest on the bottom of the channel, while its sides are held firmly. On these bridges rests a 1/8-inch flat iron strip, C, 1 1/2 inches wide, and on top of the flat iron is a strip of felt of the same width. On this felt rests the glass, E. Thus the glass is raised about half an inch above the upper edge of the U-shaped channel so that the inside of the channel is open and freely exposed to the atmosphere under the skylight and is therefore of the same temperature. This makes the channel proof against the formation of sweat drops and against the dropping of condensation into the space beneath. The raising of the glass above the channel also enables whatever condensation may form on the lower side of the glass to be easily conducted into the channel which serves as a gutter for its removal.

After the glass is laid on the strip of felt, another strip of felt is laid on the upper side of the glass. On top of this felt is fitted a cap of copper sheeting. The spring fits around an upright brass bolt which is screwed firmly into the bridge. The top of this bolt is threaded in such a way that it carries a quarter-inch shoulder; on this shoulder rests the bridge, J, to carry the weight of people walking on the skylight. As the bolt on which this bridge rests is screwed into the little bridge, B, the weight of any one walking on the skylight never comes on the glass at all, but is borne directly by the supporting bars, A, below the glass. The glass rests in such a way that the steel supporting bars could be bent two or three inches without bending the glass. There is therefore no danger of breakage from walking on the skylight.

The whole system allows play for any movement of the glass, whether from contraction and expansion, vibration, shock or other motion. The glass is held firmly in place, but without putty or cement. The felt and copper sheeting, held down firmly by the spiral spring, makes the skylight proof against rain, dust and draught. In heavy rain, water may percolate under the copper sheeting, through the felt and two adjoining lights, but can then drop only into the U-shaped channel, which acts also as a gutter.

The simplicity of construction and arrangement permits repairs at a minimum cost and without puttying or other tinkering.

TESTS OF THE CURTIS STEAM TURBINE.

In view of the great interest that is being taken in the different types of the steam turbine, the following description of the tests made on the Curtis steam turbine will be of interest to manufacturers. It will be remembered that at various meetings of the cotton manufacturers' associations the merits of the steam turbine in comparison with the steam engine have been discussed, and that cotton manufacturers are taking more than a theoretical interest in this type of machine is shown by the installation of steam turbines in several of our large new textile mills. The following letter from W. L. R. Emmet, chief engineer of the lighting department of the General Electric Co., gives some details of the machine tested:

July 6th, 1905.

Mr. J. R. Lovejoy,
Manager Lighting Department.

Dear Sir: The accompanying report gives results of test recently made by Mr. Frederick Sargent and Mr. Louis A. Ferguson of a 2,000 kw. steam turbine generating unit of the Curtis type. The turbine is a four-stage machine designed in 1903 and recently changed in a few particulars as a result of experiments conducted during the past year. The machine as tested conforms as nearly as possible to the standard four-stage machines now being produced, but is less efficient since the changes made have been confined to the buckets, while several other important changes, which we know to be desirable, could not be made in this case without entirely rebuilding the machine.

The machine tested is of 2,000 kw. capacity and operates at 900 R. P. M.

The results here reported have been determined by the most accurate methods and have been verified by repeated tests in addition to those con-

ducted by Messrs. Sargent & Ferguson, duly considering the steam pressure, vacuum and superheat.

W. L. R. Emmet.

(Facsimile)

Chicago, July 3, 1905.

E. W. Rice, Jr., Third Vice President General Electric Co., Schenectady, N. Y.

Dear Sir: We beg to submit herewith the report of tests made on a two thousand k.w. Curtis turbine made at Schenectady under our supervision May 3, 1905, as follows:

We sent our assistants, Messrs. Clark & Eastman, to Schenectady to prepare the apparatus for making these tests and they made several preliminary trials before our arrival and the results of each of the trials very closely approximated the results of the official tests herein mentioned. We had all the instruments carefully tested and standardized during the trials, the electrical instruments being tested by the New York Testing Laboratory in the presence of Mr. Eastman. The surface condenser showed practically no leakage. We took every precaution to satisfy ourselves that the tests were reliable and accurate, and we beg to certify that the results obtained were as follows:

Full Load Test.

Duration of test, hour	1.25
Steam pressure (gauge), lbs.	166.3
Back pressure (absolute), in. of mercury	1.49
Superheat, deg. F.	207
Load in Kilo-Watts	2023.7
Steam consumption per K. W. hour, lbs.	15.02

Half Load Test.

Duration of test, hour	0.916
Steam pressure (gauge), lbs.	170.2
Back pressure (absolute), in. of mercury	1.40
Superheat, degrees F.	120
Load in Kilo-Watts	1066.7
Steam consumption per K. W. hour, lbs.	16.31

Quarter Load Test.

Duration of test, hour	1
Steam pressure (gauge), lbs.	155.5
Back pressure (absolute), in. of mercury	1.45
Superheat, degrees F.	204
Load in Kilo-Watts	555
Steam consumption per K. W. hour	18.09

Zero Load.

Duration of test, hour	1.33
Steam pressure, lbs.	154.5
Back pressure (absolute), in. of mercury	1.85
Superheat, degrees F.	156
Steam consumption per hour, lbs.	1510.5

Respectfully submitted,

Louis A. Ferguson,

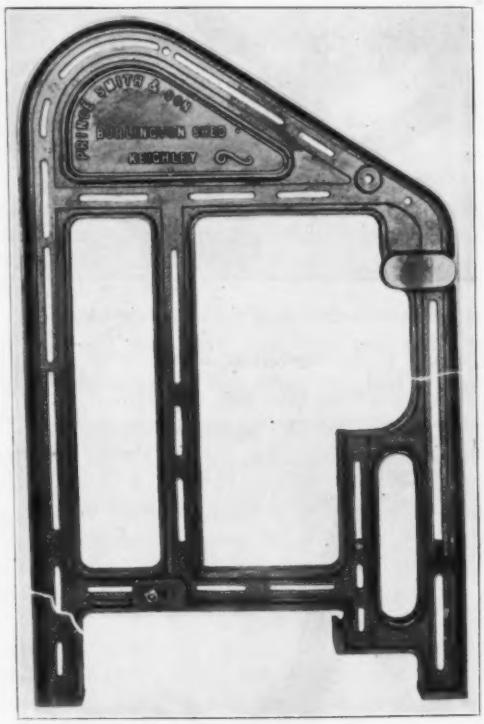
Second Vice Pres. Commonwealth Electric Co.

F. Sargent,

Sargent & Lundy.

BROKEN CASTINGS MADE GOOD AS NEW.

A most interesting subject that has come to our attention is the brazing of cast iron parts by the process known as "Ferrofix." There are skeptics who say that cast iron has never been brazed and that it is, therefore, impossible; but like any new art, after having been thoroughly demonstrated as to its usefulness, durability and practicability in the mechanical world, it is taking its place as one of the most useful inventions and industrial discoveries of recent years.



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The Textile Industries cannot help but be

pieces, no dripping of condensation from the inside of the glass. This feature will particularly appeal to textile manufacturers, many of whom have experienced the annoyance of dropping from condensation, especially in dyehouses.

The construction of the "Anti-Pluvius" system of skylighting is as follows: The steel supporting bar, A, is U-shaped, giving a maximum of strength with a minimum of weight. The small wedge-shaped cast steel bridge fitting into the U-shaped bar carries the weight of the skylight, and for that reason fits firmly into the bar in such a way that its lower ends rest on the bottom of the channel, while its sides are held firmly. On these bridges rests a 1/8-inch flat iron strip, C, 1 1/2 inches wide, and on top of the flat iron is a strip of felt of the same width. On this felt rests the glass, E. Thus the glass is raised about half an inch above the upper edge of the U-shaped channel so that the inside of the channel is open and freely exposed to the atmosphere under the skylight and is therefore of the same temperature. This makes the channel proof against the formation of sweat drops and against the dropping of condensation into the space beneath. The raising of the glass above the channel also enables whatever condensation may form on the lower side of the glass to be easily conducted into the channel which serves as a gutter for its removal.

After the glass is laid on the strip of felt, another strip of felt is laid on the upper side of the glass. On top of this felt is fitted a cap of copper sheeting. The spring fits around an upright brass bolt which is screwed firmly into the bridge. The top of this bolt is threaded in such a way that it carries a quarter-inch shoulder; on this shoulder rests the bridge, J, to carry the weight of people walking on the skylight. As the bolt on which this bridge rests is screwed into the little bridge, B, the weight of any one walking on the skylight never comes on the glass at all, but is borne directly by the supporting bars, A, below the glass. The glass rests in such a way that the steel supporting bars could be bent two or three inches without bending the glass. There is therefore no danger of breakage from walking on the skylight.

The whole system allows play for any movement of the glass, whether from contraction and expansion, vibration, shock or other motion. The glass is held firmly in place, but without putty or cement. The felt and copper sheeting, held down firmly by the spiral spring, makes the skylight proof against rain, dust and draught. In heavy rain, water may percolate under the copper sheeting, through the felt and two adjoining lights, but can then drop only into the U-shaped channel, which acts also as a gutter.

The simplicity of construction and arrangement permits repairs at a minimum cost and without puttying or other tinkering.

TESTS OF THE CURTIS STEAM TURBINE.

In view of the great interest that is being taken in the different types of the steam turbine, the following description of the tests made on the Curtis steam turbine will be of interest to manufacturers. It will be remembered that at various meetings of the cotton manufacturers' associations the merits of the steam turbine in comparison with the steam engine have been discussed, and that cotton manufacturers are taking more than a theoretical interest in this type of machine is shown by the installation of steam turbines in several of our large new textile mills. The following letter from W. L. R. Emmet, chief engineer of the lighting department of the General Electric Co., gives some details of the machine tested:

July 6th, 1905.

Mr. J. R. Lovejoy,
Manager Lighting Department.

Dear Sir: The accompanying report gives results of test recently made by Mr. Frederick Sargent and Mr. Louis A. Ferguson of a 2,000 kw. steam turbine generating unit of the Curtis type. The turbine is a four-stage machine designed in 1903 and recently changed in a few particulars as a result of experiments conducted during the past year. The machine as tested conforms as nearly as possible to the standard four-stage machines now being produced, but is less efficient since the changes made have been confined to the buckets, while several other important changes, which we know to be desirable, could not be made in this case without entirely rebuilding the machine.

The machine tested is of 2,000 kw. capacity and operates at 900 R. P. M.

The results here reported have been determined by the most accurate methods and have been verified by repeated tests in addition to those con-

ducted by Messrs. Sargent & Ferguson, duly considering the steam pressure, vacuum and superheat.

W. L. R. Emmet.

(Facsimile)

Chicago, July 3, 1905.

E. W. Rice, Jr., Third Vice President General Electric Co., Schenectady, N. Y.

Dear Sir: We beg to submit herewith the report of tests made on a two thousand k.w. Curtis turbine made at Schenectady under our supervision May 3, 1905, as follows:

We sent our assistants, Messrs. Clark & Eastman, to Schenectady to prepare the apparatus for making these tests and they made several preliminary trials before our arrival and the results of each of the trials very closely approximated the results of the official tests herein mentioned. We had all the instruments carefully tested and standardized during the trials, the electrical instruments being tested by the New York Testing Laboratory in the presence of Mr. Eastman. The surface condenser showed practically no leakage. We took every precaution to satisfy ourselves that the tests were reliable and accurate, and we beg to certify that the results obtained were as follows:

Full Load Test.

Duration of test, hour	1.25
Steam pressure (gauge), lbs.	166.3
Back pressure (absolute), in. of mercury	1.49
Superheat, deg. F.	207
Load in Kilo-Watts	2023.7
Steam consumption per K. W. hour, lbs.	15.02

Half Load Test.

Duration of test, hour	0.916
Steam pressure (gauge), lbs.	170.2
Back pressure (absolute), in. of mercury	1.40
Superheat, degrees F.	120
Load in Kilo-Watts	1066.7
Steam consumption per K. W. hour, lbs.	16.31

Quarter Load Test.

Duration of test, hour	1
Steam pressure (gauge), lbs.	155.5
Back pressure (absolute), in. of mercury	1.45
Superheat, degrees F.	204
Load in Kilo-Watts	555
Steam consumption per K. W. hour	18.09

Zero Load.

Duration of test, hour	1.33
Steam pressure, lbs.	154.5
Back pressure (absolute), in. of mercury	1.85
Superheat, degrees F.	156
Steam consumption per hour, lbs.	1510.5

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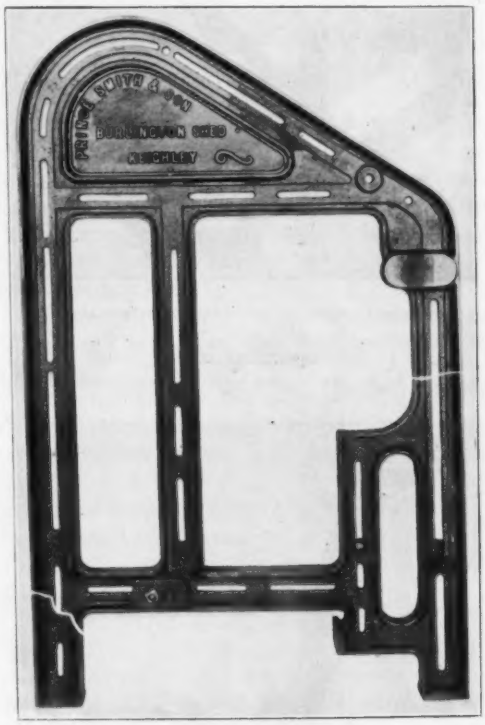

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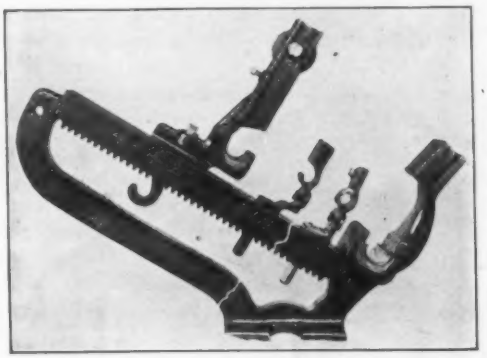
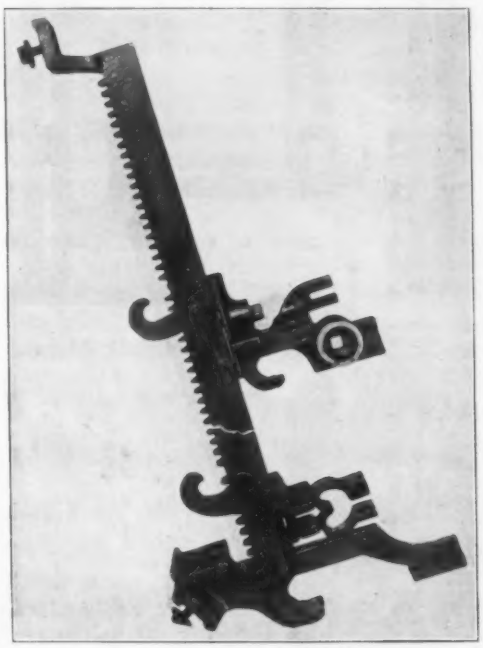
The Textile Industries cannot help but be

interested in its development and after once having given it a practical test will rely upon the restoration of castings by this means rather than by patching or discarding entirely and replacing with new. Naturally the time



BROKEN CASTING TO BE REPAIRED BY FERROFIX.

element is an important factor to be considered. Ordinary parts can be repaired by the



BROKEN CASTING TO BE REPAIRED BY FERROFIX.

Ferrofix process within a few hours, ready to place back in the machines from which they come, thereby not only saving a large percentage of cost but also the possibility of a shut-down in that part of the plant from which they are taken, particularly if a duplicate part is not at hand.

The illustrations which are shown in connection with this article are only a few of the many parts which have been made as good as new by The American Ferrofix Brazing Company whose executive offices are located in the Arcade Building, Philadelphia, with plants at 2024 Cuthbert St., Philadelphia, 795 Greenwich St., New York City, Pittsburg and Scranton.

A GERMAN PICKER FOR UNDERPICK LOOMS.

The advantages as claimed for this picker are simplicity of construction and consequently cheapness, combined with durability; its principle of construction (looped receiv-

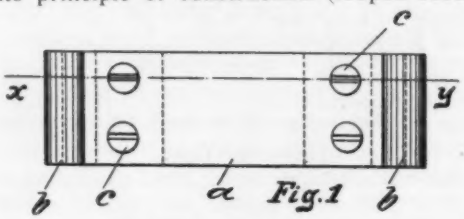


Fig. 1

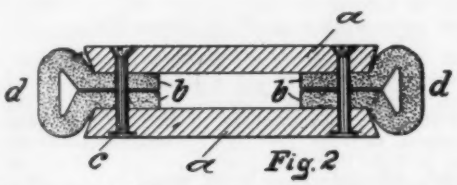


Fig. 2

ing and sending buffers) at the same time resulting in a saving in wear to the shuttles as are used in connection with it.

The new picker, as will be seen by consulting the accompanying two illustrations, of which Fig. 1 is a side view of said picker, and Fig. 2 a longitudinal section of it taken on line x y, Fig. 1, consists of two short flat pieces, a, made of ebonite, paper or iron, inwardly beveled at their short ends, and between which canvas or leather strips, b, are inclosed, and secured in position by means of rivets, c, said strips, b, projecting at both ends in the form of a loop, d, and which in turn forms the buffer for the picker.

Dyeing, Bleaching, Printing, Etc.

COMPARISON OF THE METHODS FOR THE ANALYSIS OF WOOL, COTTON AND SILK.

BY JOSEPH COLLINGWOOD.

Prize Thesis for Textile World Record Gold Medal.

(Continued from July.)

THE SEPARATION OF WOOL AND COTTON.

Many methods for the separation and quantitative estimation of the constituents in a wool-cotton material have been proposed. Chief among these is the method for separating the cotton by dissolving the wool in caustic potash. This treatment for removing the wool is an old one and is based upon the action of alkalies upon wool. This method is by far the quickest now in use, although the treatment of a mixed fabric with sulphuric acid is equally as good.

The weighed fabric was immersed in a boiling solution of caustic potash of 9 degrees Tw., or 1.045 sp. gr. The wool was rapidly attacked and entirely dissolved in nine minutes. The cotton was filtered off, washed thoroughly with water to remove all traces of alkali, and dried in an air oven at 100 degrees C. The length of time the wool takes to dissolve varies with the amount of fibre and the strength of the caustic potash solution, and the loss the cotton suffers, varies with these conditions. The average loss, however, is about 3 per cent. and such a correction on the weight of real cotton fibre should be made.

A second method for the separation of these two fibres into their component parts is to remove the cotton. This is effectively done by steeping the fabric in a 20 per cent. solution of sulphuric acid for from twelve to fourteen hours. At the end of that time the fibres are removed and washed with a solution of alcohol, one part alcohol to three parts water. On drying in an air oven the cotton fibre becomes blackened or carbonized, and is very readily dusted out. This dusting must not be too severe, or else too much of the wool fibre is lost. By this treatment the wool fibre only suffers a loss of about 2 per cent. and therefore is satisfactory. This method is based on the destructive action of acids in general on the vegetable fibres.

These two methods of analyses are old methods that have been renewed since about the year 1863.

Another method for the removal of the cotton is by the use of an ammoniacal solution of copper oxide. This treatment was suggested and put into effect by Cramer in the year 1857. (See Vierteljahrsschrift der Natur for Schenden Gesellschaft in Zurich, 1857, pp. 395.)

He proved, however, that only the cellulose of the cell wall was dissolved and not the cuticle.

This treatment is not very satisfactory. In the first place, it takes too long to dissolve the cotton, which it does not do completely in any event. Then the wool fibre becomes saturated with the copper hydrate, which has been precipitated out of solution. This is very hard to remove, and the wool fibre gradually becomes disintegrated.

On the other hand cotton that has been mercerized or previously treated with caustic potash is very readily dissolved in about three minutes. This fact is the chief objection to its use, for if a fabric must be treated with caustic potash to aid in the removal of the cotton the latter operation can be done away with and the wool dissolved.

REMOVING SILK FROM WOOL.

No method has yet been discovered or proposed for leaving the silk in an analysis of a wool-silk or cotton-silk material. Generally, ease and quickness of operation and accuracy of results have been the test for any method. These have been supplied in the separations by dissolving the silk.

Various methods of determining the proportion of silk in mixed wool and silk fabrics have been proposed, the best of which are the following:

(1) Dissolving the silk in cold concentrated hydrochloric acid.

(2) Dissolving the silk in cold concentrated basic zinc chloride.

(3) Dissolving the silk in cold concentrated ammoniacal nickel oxide.

The method in which the silk is dissolved by cold concentrated hydrochloric acid, is about as good a method as there is for the analysis of these two fibres, and the process is as follows: The weighed portion of wool-silk fabric, after being well "wet-out," was entered into a solution of cold concentrated chemically pure hydrochloric acid of about 40 per cent. strength. The silk dissolved immediately; the wool was filtered off and thoroughly washed with a solution of sodium bicarbonate, and with water. The wool is not materially affected by this treatment, although it lost about 1/2 per cent. of its original weight.

By using a concentrated solution of ammoniacal nickel oxide, Richardson dissolved the silk in the cold by treating two minutes, the wool and cotton fibres being only slightly affected. This reagent was experimented with in the following manner: The weighed quantity of wool and silk was immersed in a cold solution of the nickel oxide of .95 sp. gr. The temperature was gradually raised to about 110 to 115 degrees F., and the silk dissolved in about three minutes. The residue, consisting of wool, was filtered off, washed with dilute hydrochloric acid solution, and then with distilled water. When perfectly dry the wool was weighed and found to have lost only 1.4 per cent. The washing with dilute acid prevented any precipitated nickel oxide from remaining in the fibre and so causing an increase in the weight.

With basic zinc chloride, Persoz did not obtain very good results. One source of error was in not using oven-dried material, as air-dried fibre has a varying percentage of water from day to day. Richardson, instead of boiling the sample as Persoz did, merely dipped the fabric into a boiling solution of the reagent and found this treatment sufficient. The wool fibres lost only 1.5 per cent. to 2 per cent., while the cotton lost but 0.5 per cent.

As the wool and silk fibres are so alike, any reagent which will act on one will also act upon the other to a greater or less extent. Therefore treatment with a solution of this strength may be severe on the wool, but if proper care is exercised good results can be obtained. The following is the manner in which the process was carried out: The wool and silk fabric was dipped in a boiling solution of basic zinc chloride twice and then washed in dilute hydrochloric acid, and finally in water. The acid bath dissolved all the basic zinc chloride and so prevented its precipitation on the fibre in the form of zinc hydrate. The latter, once the fibre becomes impregnated with it, is very hard to remove. The residue of wool when dry was weighed and the loss was 1.8 per cent.

THE SEPARATION OF SILK FROM COTTON.

For the analysis of cotton-silk fabrics the same reagents can be used, provided the same precautions are followed out. However, methods can be used with this combination of the fibres that could not be used in the separation of wool and silk, because the constituents are of different natures. Of the three methods for the analysis of wool-silk fabrics, the one which seems to be best suited for the analysis of cotton-silk materials is the treatment with ammoniacal nickel oxide. The cotton and silk are entered into the cold ammoniacal solution of nickel oxide gently heated. The silk dissolves in about three minutes. After washing with dilute hydrochloric acid and drying in an air-oven, the cotton was found to have lost only 1.2 per cent.

The treatment with basic zinc chloride is a little more severe on the cotton, and the residue, after dissolving the silk, must be washed with dilute hydrochloric acid, otherwise the zinc hydrate will be precipitated in the fibre as before. This is extremely hard to remove without affecting the cotton considerably; more so than in the case of wool-silk analysis by this method. However, with washing with hydrochloric acid, the loss was only three per cent.

By the removal of the silk by concentrated hydrochloric acid, the cotton suffers to even a greater extent. The great disadvantage of this method is that unless the cotton is very

thoroughly washed it becomes carbonized on heating. This can be largely prevented by washing the residue on the filter by a solution of sodium bicarbonate and then with water. Any excess of acid is thus removed. The cotton lost about 4 per cent. by this method, which is therefore not so satisfactory to use as either of the other methods.

It has been suggested that an alkaline solution of copper and glycerine would be an excellent solvent for the silk. This is true, but the fact is that so much of the other two fibres are also dissolved that the method is of no practical value.

SEPARATION OF WOOL, COTTON AND SILK.

The analysis of the three fibres is simply an application of the best methods for separating two of the fibres in a mixture of all. However this does not always prove satisfactory because of the fact that a reagent which separates two very well has a destructive action on the third.

The separation by means of which the silk is first dissolved has been found to be the only method of practical value. The separation by dissolving two of the constituents at the same time has received quite a little attention. This, however, is not quite as accurate as the separation of one of the fibres at a time.

In the analysis of the three fibres the foregoing reagents for separating the silk were used, each with somewhat varying results, and the two methods for the separation of cotton and wool were alternately tried. The analysis by the use of basic zinc chloride was carried out as follows: The weighed fibre was dipped twice in the boiling solution of basic zinc chloride, and similarly was washed wth dilute hydrochloric acid and water. On drying and reweighing the wool was found to have lost 3 per cent and the cotton 4 per cent. The second experiment, however, gave somewhat lower results, the wool losing 1.5 per cent. and the cotton 3 per cent. This variation is no doubt due to the treatment with hydrochloric acid and the severe washing necessary to remove completely all the basic zinc chloride and prevent the precipitation of zinc hydrate.

In the first experiment the wool was removed by boiling in the caustic potash solution. Two minutes only were required to entirely dissolve all the wool. After drying and weighing the cotton was found to have lost 3 per cent. In the second experiment the cotton was treated with 20 per cent. sulphuric acid solution, and carbonized, the wool losing 3.2 per cent. This method is not as satisfactory as the treatment with concentrated hydrochloric acid to remove the silk. Somewhat more concordant results were obtained with this reagent. The weighed fibre was dipped into the concentrated hydrochloric acid solution and stirred, the silk dissolving almost instantly. The excess acid was quickly poured off, the fibre filtered and washed thoroughly with sodium bicarbonate to remove any excess acid, and with water: the wool lost 3.4 per cent. and the cotton lost 5.1 per cent. by this treatment.

The cotton was next removed by steeping in sulphuric acid as before and carbonized; on weighing the wool was found to have lost only 2.1 per cent. This percentage loss, however, varies with the amount of dusting necessary to remove the cotton. A second experiment, by removing the silk by hydrochloric acid was made, and the wool eliminated by caustic potash, leaving the cotton. After the first treatment, or with hydrochloric acid, the cotton fibre was found to have lost nearly 6 per cent., while the wool had lost 4 per cent. Besides this the treatment with caustic potash caused a loss of 4 per cent. to the cotton.

Care must be taken in dissolving the silk by hydrochloric acid, that all the acid is completely removed. If this is not done the cotton becomes prematurely removed by being carbonized.

The best results, however, were obtained by the use of ammoniacal nickel oxide. The treatment required a little more time to completely dissolve the silk, but the action on the other two constituents was less severe. The experiment was carried out as detailed in the analysis of wool-silk fabrics by this reagent. The weighed material was steeped in a lukewarm solution of ammoniacal nickel oxide until all the silk was dissolved, the time required being about three minutes. On drying and reweighing, the cotton had lost 1.2

per cent. and the wool 1.5 per cent. The wool was then removed in the usual manner by treatment with caustic potash.

In the second experiment, using this reagent, the wool lost only 0.8 per cent. and the cotton 1.1 per cent. On eliminating the cotton by sulphuric acid, the wool was found to have lost 4 per cent.

After the treatment with ammoniacal nickel oxide a slightly acid bath is given the wool and the cotton to remove any precipitate of nickel hydrate, which is very apt to be found in the fibre.

From the foregoing results it is a matter of choice which method is the best adapted for the separation of wool and cotton, as each gives about equal results. However, the quickness with which the caustic potash dissolves the wool gives this method a slight preference over the somewhat slower method of destroying the cotton by treatment by sulphuric acid and carbonizing.

For the analysis of wool-silk fabrics, the treatment with hydrochloric acid is slightly better than the solution of the silk by ammoniacal nickel oxide. However the latter is by far the better reagent to use to dissolve the silk from cotton fabrics, as the cotton is too readily destroyed by the concentrated hydrochloric acid.

There is only one proper reagent for the analysis of silk when all three fibres are combined and that is the solution of ammoniacal nickel oxide. Although this reagent may be a trifle slow when compared with the other two reagents, it is thorough and only a slight action upon the other two fibres is noticeable. The best temperature at which to dry residues is at about 102 degrees C., the water being expelled as readily, and the material does not become as friable, as at higher temperatures.

In regard to corrections that should be made in the course of an analysis, the amount is a variable quantity at all times. In the first place, no set rule can be laid down by which the amount of water present in a sample can be determined, and the proper amount awarded to each constituent. Different fibres, even different grades of wool, absorb different amounts of moisture from the air. This amount of moisture also varies with the climate, the temperature and the humidity of the atmosphere from day to day. However, it is generally considered that 18 per cent., 8 per cent. and 11 per cent. are the amounts of moisture normally present in wool, cotton and silk respectively. Therefore an analysis to find the water having been made, weights proportionate to the above can be added to the weight of bone-dry fibre found, to give the relative amounts of air-dry fibre.

The correction for finishing materials will vary with the kind of goods that are being analyzed. The treatment with soda ash alone has a greater deteriorating action on the fibres than does the treatment of 1 per cent. hydrochloric acid and 1/20 per cent. soda ash. The latter, however, is sufficient to remove material and sizes. Mordanting and weighting materials are removed with more difficulty. The fibres suffer a considerable loss, however; wool and silk each lose 3 per cent. while cotton loses 2 per cent.

For the corrections to be added to the weight of fibre obtained by an analysis according to one of the foregoing methods, an average result is taken, except in the case of the analysis of two of the fibres. The following is a table of the results of each method, and the proper corrections:

Separation of

(1) Wool-Cotton material.
- (a) Wool dissolved by caustic potash; correction for loss of cotton, 3%
- (b) Cotton dissolved by sulphuric acid; correction for loss of wool, 2.5%

(2) Wool-Silk material.
- (a) Silk dissolved by hydrochloric acid; correction for loss of wool, .43%
- (b) Silk dissolved by ammoniacal nickel oxide; correction for loss of wool, 1.4%
- (c) Silk dissolved by basic zinc chloride; correction for loss of wool, 1.8%

(3) Cotton-Silk material.
- (a) Silk dissolved by hydrochloric acid; correction for loss of cotton, 4.1%
- (b) Silk dissolved by ammoniacal nickel oxide; correction for loss of cotton, 1%
- (c) Silk dissolved by basic zinc chloride; correction for loss of cotton, 1.3%

(4) Wool-Cotton-Silk material.
- (a) Silk dissolved by hydrochloric acid; correction for loss of wool, 3%
  correction for loss of cotton. 5%
- (b) Silk dissolved by ammoniacal nickel oxide; correction for loss of wool. 1%
  correction for loss of cotton, 1.1%

(c) Silk dissolved by basic zinc chloride;
correction for loss of wool, 2%
correction for loss of cotton, 3%

EXPERIMENTAL RESULTS.

Estimation of Finishing Materials upon a fabric.

The sample was boiled 10 minutes in a one per cent. solution of hydrochloric acid; then washed, and boiled 10 minutes in a $\frac{1}{20}$ per cent. solution of soda ash.

Weight of wool taken,	1.3710 grs.	
Weight after treatment,	1.3285 grs.	
Loss,	.0425 grs.	3.1%
Weight of cotton taken,	1.7875 grs.	
Weight after treatment,	1.7480 grs.	
Loss,	.0395 grs.	2.2%
Weight of silk taken,	.5280 grs.	
Weight after treatment,	.5110 grs.	
Loss,	.0170 grs.	3.2%

Estimation of Wool-Cotton by caustic potash.

Weight of mixture taken,	3.3310 grs
Weight of cotton left,	1.8385 grs.
Difference as wool,	1.4925 grs.

Hence: —
Cotton found, 55.2; theoretical cotton, 56.7.
Wool found, 44.8; theoretical wool, 43.3.

Estimation of Wool-Cotton by sulphuric acid.

Weight of mixture taken,	3.1705 grs.
Weight of wool left,	1.1340 grs.
Difference as cotton,	2.0365 grs.

Hence:—
Wool found, 35.8; theoretical wool, 36.3.
Cotton found, 64.2; theoretical cotton, 63.7.

1. Estimation of Wool-Silk by conc. hydrochloric acid.

Weight of material taken,	.1515 grs.
Weight of wool found,	.1155 grs.
Difference as silk,	.0360 grs.

Hence:—
Wool found, 76.24; theoretical, 76.6.
Silk found, 23.76; theoretical, 23.4.

2. Estimation of Wool-Silk by ammoniacal nickel oxide.

Weight of material taken,	.1300 grs.
Weight of wool found,	.1005 grs.
Difference as silk,	.0295 grs.

Hence:—
Wool found, 77.3; theoretical, 78.5.
Silk found, 22.7; theoretical, 21.5.

3. Estimation of Wool-Silk by basic zinc chloride.

Weight of material taken,	.1150 grs.
Weight of wool left,	.0823 grs.
Difference as silk,	.0327 grs.

Hence:—
Wool found, 71.5; theoretical, 81.7.
Silk found, 28.5; theoretical, 18.3.

1. Estimation of Cotton-Silk by conc. hydrochloric acid.

Weight of material taken,	.1135 grs.
Weight of cotton left,	.0765 grs.
Difference as silk,	.0370 grs.

Hence:—
Cotton found, 67.5; theoretical, 70.
Silk found, 32.5; theoretical, 30.

2. Estimation of Cotton-Silk by ammoniacal nickel oxide.

Weight of material taken,	.1287 grs.
Weight of cotton left,	.0829 grs.
Difference as silk,	.0458 grs.

Hence:—
Cotton found, 64.42; theoretical, 65.12.
Silk found, 35.52; theoretical, 34.88.

3. Estimation of Cotton-Silk by basic zinc chloride.

Weight of material taken,	.1125 grs.
Weight of cotton left,	.0789 grs.
Difference as silk,	.0336 grs.

Hence:—
Silk found, 29.87; theoretical, 28.89.
Cotton found, 70.13; theoretical, 71.11.

1. Estimation of Wool, Cotton and Silk.

(a) Silk by ammoniacal nickel oxide.

Weight of material taken,	.2232 grs.
Weight of wool and cotton left,	.1845 grs.
Difference as silk,	.0387 grs.

(b) Wool, by caustic potash.

Weight of wool-cotton taken,	.1845 grs.
Weight of cotton left,	.0905 grs.
Difference as wool,	.0940 grs.

Hence:—
Silk found, 17.3; theoretical, 16.1.
Wool found, 42.1; theoretical, 41.2.
Cotton found, 41.6; theoretical, 42.7.

2. (a) Silk by ammoniacal nickel oxide.
(b) Cotton by H_2SO_4.

Weight of mixture,	.1600 grs.
Weight of wool and cotton left,	.1411 grs.
Difference as silk,	.0189 grs.
(b) Weight of wool-cotton,	.1411 grs.
Weight of wool left,	.0623 grs.
Difference as cotton,	.0788 grs.

Hence:—
Silk found, 11.8; theoretical, 10.9.
Wool found, 39; theoretical, 41.
Cotton found, 49.2; theoretical, 48.1.

1. Estimation of Wool, Cotton and Silk.

(a) Silk dissolved by conc. hydrochloric acid.

Weight of material taken,	.2490 grs.
Weight of wool-cotton left,	.1927 grs.
Difference as silk,	.0563 grs.

(b) Wool by caustic potash.

Weight of wool-cotton,	.1927 grs.
Weight of cotton left,	.0945 grs.
Difference as wool,	.0982 grs.

Hence:—
Silk found, 22.6; theoretical, 18.9.
Woolfound, 39.4; theoretical, 38.9.
Cotton found, 38; theoretical, 42.2.

2. (a) Silk dissolved by conc. hydrochloric acid.

Weight of material taken,	.2524 grs.
Weight of wool-cotton left,	.1837 grs.
Difference as silk,	.0687 grs.

(b) Cotton removed by sulphuric acid.

Weight of wool-cotton,	.1837 grs.
Weight of wool left,	.0680 grs.
Difference as cotton,	.1157 grs.

Hence:—
Silk found, 27.2; theoretical, 23.7.
Wool found, 24; theoretical, 28.6.
Cotton found, 48.8; theoretical, 47.7.

1. Estimation of Wool-Cotton and Silk.

(a) Silk dissolved by basic zinc chloride.

Weight of material taken,	.2236 grs.
Weight of wool-cotton left,	.183 grs.
Difference as silk,	.0406 grs.

(b) Wool eliminated by caustic potash.

Weight of wool-cotton,	.1830 grs.
Weight of cotton,	.0543 grs.
Difference as wool,	.1287 grs.

Hence:—
Silk found, 18.1; theoretical, 14.7.
Wool found, 57.5; theoretical, 59.
Cotton found, 24.4; theoretical, 26.3.

2. (a) Silk dissolved by basic zinc chloride.

Weight of the three fibres,	.1695 grs.
Weight of wool and cotton left,	.1385 grs.
Difference as silk,	.0310 grs.

(b) Cotton by sulphuric acid.

Weight of wool-cotton,	.1385 grs.
Weight of wool left,	.104 grs.
Difference as cotton,	.0345 grs.

Hence:—
Silk found, 18.4; theoretical, 16.8.
Cotton found, 20; theoretical, 19.7.
Wool found, 61.6; theoretical, 63.5.

A writer in 1710 mentions that "the manufacturers of Manchester had prospered to such a degree that instead of their old wooden dwellings composed of radlings and daub, they had begun to build brick houses with palisadoes and other decorations."

About 1793 the trade of muslin weaving in Lancashire was "the trade of a gentleman; the operatives brought home their work in ruffled shirts and top boots, they had a cane, and took a coach in some instances, and appeared as well as military officers of the first degree."

A NEW PROCESS OF INDIGO DYEING.

It is well known that indigo behaves differently from most other dyes and requires different treatment. It cannot be boiled on to the goods like logwood, unless it is first completely changed to something else by treatment with sulphuric acid, and then the color so dyed is by no means fast, whereas "vat dyed" indigo is absolutely the fastest known color. The essential principle of vat dyeing is to change the indigo blue to indigo white; to get this indigo white into a soluble state, and then immerse the goods to be dyed in it. They then absorb the dye and on being lifted from the vat, come out a light yellow color, which on exposure to the air turns first green and then blue. In fact, indigo blue is the rust of indigo white.

Indigo blue is changed to indigo white by bringing it into contact with gases that deprive it of its oxygen, and the indigo white is rendered soluble by the addition of alkali. The earliest method was to mix crude, freshly made indigo with saltpetre and dates, and use four pounds of the mixture to a gallon of water. In the temperature of the tropics it soon fermented and effected the desired change. This is more generally obtained by what is called the woad vat. Woad is seldom used nowadays, but starting with liquor that has overflowed from the other vats at work and which is full strong already, a quantity of ground indigo paste is added. Some bran is also added and freshly slacked lime thrown in, the whole heated up and then left to ferment and work. It takes about three days to get fit. There being a large quantity of indigo in the vat, increased from time to time, it takes months before an average rate of cost can be estimated, and it also requires a man to manage it who is specially trained to recognize and regulate the degree of fermentation, as well as to handle the goods to be dyed.

Other processes are carried on in the cold for cotton dyeing, and depend on the formation of hydrogen by the action of either zinc or copperas on the water. Lime is also used. These processes have been in use for hundreds of years.

Some years ago Schutzenberger &

Lalande patented a new process which effected the change from indigo blue to indigo white by treating zinc powder with fourteen times its weight of bisulphite of soda and adding lime. This was taken up by Read Holliday of Huddersfield, England, and came to be called the "Holliday vat." He usually sold paste of indigo white in a state ready to dye on the addition of water. These patents are long expired. The Holliday vat with a few modifications is largely used for piece dyeing, but not for wool. Mr. James Cowan of Glasgow patented a new process, far simpler and quicker than anything known before. He ground together indigo, zinc dust and carbonate of potash in certain definite proportions. This patent powder, when mixed with an equal bulk of bisulphate of soda, and then stirred into boiling water, instantly made a grand vat, which when cooled down to a comfortable temperature, turned out fine work.

I became interested in this process and had much experience with it. Mr. Cowan made some experiments that suggested further possibilities and I set to work to find out how to obtain every time the startling results that had occasionally showed themselves. After years of research I found that there was a rule by which the maximum color would always be obtained from any given quantity of indigo. I found that there was a definite proportion between the quantity of indigo, the amount of water, the weight of goods to be dyed and the weight of zinc dust to be used. Further, that the proportion of bisulphite of soda to the zinc should be much smaller than was supposed to be necessary; and that while the zinc and the bisulphite increased in arithmetical progression, the amount of carbonate of potash (alkali) increased, not in arithmetical progression, but in something more like geometrical progression.

The change from indigo blue to indigo white is made by furiously boiling the indigo along with the other ingredients for five minutes. It was found that to leave the wares all together in the dye vat, led to various complications, as they kept on working, with the result of destroying more or less the dyeing power of the indigo. This difficulty was obviated by the novel idea of boiling the ingredients in a mixing vat erected at a higher level than the dye vats. When the wares have been boiled in this mixing vat, the steam is shut off, the liquor immediately settles clear, and is then run through a hose into the dye vat, leaving the wares precipitated at the bottom of the mixing vat. These are then run off and sold to makers of zinc oxide, while the liquor in the dye vat is very nearly the color of, and as clear as a glass of pale sherry, and dyes beautifully. After dyeing a vat full, another charge of clear liquor is run into the dye vat from the mixing vat, and the work goes on all day without loss of time.

It is claimed for this process that it greatly reduces the cost of dyeing to manufacturers employing dyers. At all events it enables any dyer to produce work equal to that of the most expert dyers. I was not certain till lately that it would really dye cheaper than it actually cost a few of the most expert woad vat dyers. However, a west of England public dyer, who has been using my process for the last two years on high class pieces, was praising it the other day. He had greatly increased his business by it, and one of his customers said he had had over 300 pieces dyed by it and had never had better or cleaner work. The dyer said it "knocked the old process into a cocked hat." It is well known that woad vat dyers are a very conservative and prejudiced race and this dyer having thirty woad vats for wool was no exception. I took the opportunity to ask him if the new process would not beat the woad vat as well as the old zinc dust vat. The reply was:

"That is where you make a mistake; it will never oust the woad vat."

I then pulled out a pattern of wool dyed with 7 per cent. of indigo and asked him if he really could dye the shade at a lower cost than the use of bran and lime instead of zinc, bisulphite of soda and carbonate of potash would enable him to do. The dyer was staggered and unable to reply. A few days after I showed him a pattern of wool dyed with 6 per cent. of indigo at 60 cents per pound.

The dyer looked at it, and made no comment, but said:

"Will you please arrange at once to put in a vat for wool dyeing by your process?"

One valuable feature of the new process is that it enables dye tests of indigo to be made accurately and quickly in the laboratory. Two samples of indigo can be as accurately dye tested in 1 1/2 hours as any aniline dye can be. Hitherto dye tests of indigo have been found uncertain and unreliable and arbitrary chemical tests preferred. The latter will now be superseded by this new process.

ALEX. W. PLAYNE.

Dunkirk Mills, Stroud, Eng.

ANILINE BLACK ON COTTON.

Editor Textile World Record:

In your issue of June, 1905, there is an article with this heading and I wish to take exception to some of the statements expressed therein. It has been my good fortune to bring the production of oxidized black to such a perfection as to refute entirely the statements made in your article. I contend that the actual methods used for producing oxidized aniline black are absolutely unreliable and are only adhered to owing to the great advantage the oxidized black offers, which is the only color that dyes the fibre inside and outside. It has a brilliant hue, a well-nourished, deep color, but the efforts made to replace it are mostly due to the inability of producing an oxidized black that is uniformly perfect in every respect.

I am the possessor of a method that will produce an oxidized black that is perfect in every respect. It is a cold process, leaving the fibre intact. In fact, experts here in Europe have averred that goods dyed by my process were even stronger than the original. It is a color resisting sulphur fumes, chlore, etc., and is cheaper to produce than by the old process. The increase in actual weight varying from 16 to 18 per cent. tells its own story.

Some time ago I was called to Europe to apply this process on cotton piece goods and have proved that oxidized aniline black can now be produced in a perfect manner. I have made a series of goods now in great demand in Europe, batiste, jaconet, lawn, etc., and have proved beyond a doubt that oxidized black can be produced in an absolute, perfect, cheap and uniform manner.

CHAS. E. WILD.

New Color Cards.

Patent Dianil Black F F T Conc; H. A. Metz & Co., New York City.

Two samples of cotton yarn showing 3 1/2 per cent. dyeings of Patent Dianil Black F F T Conc.

Thiogene Black M M Conc; H. A. Metz & Co., New York City.

Three samples of cotton yarn and one of cotton piece goods dyed with different percentages of Thiogene Black M M Conc.

Immedial Indone B N Conc. Cassella Color Co., New York City.

Three samples of cotton yarn and two of cotton piece goods showing dyeings with Immedial Indone B N Conc.

Immedial Cutch; Cassella Color Co., New York City.

A folder showing samples of raw cotton, cotton yarn and piece goods dyed various shades with Immedial Cutch O and Immedial Cutch G. Full dyeing directions are given.

Direct Red C E S and 8 B; C. Bischoff & Co., New York City.

A folder showing twelve shades of these Direct Reds dyed on bleached maco yarn, cotton, half wool and half silk piece goods, for which full directions are given.

Chlorozol Brilliant Green; Read Holliday & Sons, New York City.

Two samples of cotton yarn and two of cotton piece goods showing 2 per cent. dyeings of Chlorozol Brilliant Green B and G.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 113.

Pink on Bleached Cotton Yarn.

Brilliant Direct Red G on 100 lbs. cotton yarn.

Prepare the dye bath with

1 lb. Brilliant Direct Red G.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston.)
10 lbs. Common Salt.

Enter yarn at a boil and continue boiling until the desired shade is obtained.

Brilliant Direct Red G produces shades of pink which are fairly fast to washing and to sunlight. It is particularly useful in brightening other colors.

Recipe No. 114.

Bluish Black on Worsted Yarn.

Ortho Black 3 B on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Ortho Black 3 B.
(Berlin Aniline Works, 215 Water St., New York.)
25 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., raise to a boil and dye at a boil for 1 1/2 hours.

Ortho Black 3 B possesses extraordinary fastness to light. Also good fastness to steaming, ironing, rubbing and perspiration, but its fastness to milling is less good. Cotton threads are scarcely stained by it.

Recipe No. 115.

Blue on Cotton Yarn.

Pyrogene Indigo 5 G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Pyrogene Indigo 5 G.
(A. Klipstein & Co., 122 Pearl St., New York.)
20 lbs. Sodium Sulphide Crystals.
15 lbs. Soda Ash.
50 lbs. Common Salt.

Add

1 lb. Mineral Oil

to the dye bath just before the dyeing.

Enter the yarn at 195° F. and dye for one hour just below the boil, keeping the yarn below the surface of the liquor. When the dyeing is completed squeeze well and work at once in a warm rinsing bath, 75° to 80°, containing 1 to 2 lbs. of ammonia to 100 lbs. of water. Work in this bath 1/4 hour and allow the yarn to hang for one hour in the air to oxidize. After this rinse three times in cold water and dry.

The above amounts are for the first dyeing. In the standing bath the amount of dyestuff may be reduced about one-half..

Recipe No. 116.

Dark Red on Cotton Yarn.

Tetranil Red F U on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetranil Red F U.
(American Dyewood Co., 156 William St., New York.)
25 lbs. Common Salt.

Dye yarn at a boil for one hour.

Tetranil Red F U is faster to light than the ordinary direct cotton reds. Its fastness to acids is also somewhat better. On account of its level dyeing properties it is of special interest for shading purposes.

Recipe No. 117.

Khaki Shade on Cotton Yarn.

Thiogene Khaki O on 100 lbs. cotton yarn. Prepare the dye bath with

3½ lbs. Thiogene Khaki O.
(H. A. Metz & Co., 122 Hudson St., New York.)
1½ lbs. Turkey Red Oil 50%.
5 lbs. Salt.

Enter at 180° F., and dye at a boil for one hour.

Thiogene Khaki O is a new color and produces shades resembling those obtained by the chromium iron process. The direct dyeings are sufficiently fast for ordinary purposes, but an after treatment with bichromate of potash and copper sulphate increases its fastness without materially changing the shade.

Recipe No. 118.

Blue on Worsted Yarn.

Acid Alizarine Blue "S" on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Acid Alizarine Blue "S."
(Walter F. Sykes & Co., 85 Water St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at a temperature of 160° F. Raise gradually to a boil and dye at a boil for one-half hour.

Acid Alizarine Blue "S" gives bright blue shades of exceptional fastness to light and washing, shows good penetration, dyes level and combines well with other acid colors.

Recipe No. 119.

Blue Black on Cotton Yarn.

Katigen Blue Black G on 100 lbs. cotton yarn. Prepare the dye bath with

First Bath.

16 lbs. Katigen Blue Black G.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
16 lbs. Sodium Sulphide.
8 lbs. Soda Ash.
40 lbs. Common Salt.

Standing Bath.

9.5 lbs. Katigen Blue Black G.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
9.5 lbs. Sodium Sulphide.
2 lbs. Soda Ash.
4 lbs. Common Salt.

Enter yarn at the boil and dye for one hour in the gradually cooling liquor.

The dyeing is rendered slightly bluer, clearer and faster by an after treatment in a bath containing

3 lbs. Potassium Bichromate,
3 lbs. Copper Sulphate,
5 lbs. Acetic Acid,

for 1/2 hour at a temperature of 160° F.

Katigen Blue Black G gives a fine blue black, which is very fast to light, alkalies, acids, washing, boiling and cross dyeing.

Recipe No. 120.

Violet on Worsted Yarn.

Ortho Cyanine R on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Ortho Cyanine R.
(Berlin Aniline Works, 215 Water St., New York.)
25 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., raise to a boil and dye at a boil for 1 1/2 hours.

Ortho Cyanine R possesses extraordinary fastness to light. Also good fastness to steaming, ironing, rubbing and perspiration, but its fastness to milling is less good. Cotton threads are scarcely stained by it.

Recipe No. 121.

Yellow on Bleached Cotton Yarn.

Thiazole Yellow 3 G on 100 lbs. bleached cotton yarn. Prepare the dye bath with

½ lb. Thiazole Yellow 3 G.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Glauber's Salt.

Enter the yarn at a boil and dye at a boil for one hour.

Thiazole Yellow 3 G is well adapted for the production of clear yellow shades on cotton yarn or piece goods and also in the production of compound shades with other direct cotton colors. It possesses good fastness to ironing, alkalies and chlorine and its fastness to light is somewhat better than the ordinary direct cotton yellows.

Recipe No. 122.

Navy Blue on Worsted Yarn.

Azo Navy Blue 3 B on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Azo Navy Blue 3 B.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 160° F. and dye at a boil for one hour.

Instead of Glauber's Salt and Sulphuric Acid, 20 lbs. of Bisulphate of Soda may be used.

Azo Navy Blue 3 B will be found of value in the coloring of dress goods and in yarn dyeing, particularly with yarn which is to be used for knitting. It possesses very good fastness, is of low cost, and combines well with other acid colors. It leaves white cotton and white artificial silk unstained.

Recipe No. 123.

Red on Cotton Yarn.

Benzo Fast Red F C on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Benzo Fast Red F C.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
20 lbs. Glauber's Salt.

Enter goods at the boil. Turn off steam and dye for one hour.

In dyeing light shades from 2 to 3 lbs. of soda ash should be added.

Benzo Fast Red F C may also be used to advantage in wool dyeing by preparing the dye bath as follows:

20 lbs. Glauber's Salt.
2 lbs. Acetic Acid.

Enter the yarn at 120° F., bring slowly to a boil and boil for one-half hour. Then add 3 lbs. of acetic acid in several portions.

An after treatment with chromium fluoride or bichromate renders the color somewhat faster both on cotton and wool.

Benzo Fast Red F C, when after chromed, possesses very good fastness to washing, alkalies, ironing and light.

Recipe No. 124.

Blue on Worsted Yarn.

Compound shade of blue on 100 lbs. worsted yarn. First mordant the yarn in a bath made up with

3 lbs. Potassium Bichromate.
2 lbs. Lactic Acid.

Enter yarn at 140° F. and boil from 1 to 1 1/2 hours. Lift, rinse, and then dye in a bath made up with

3 lbs. Domingo Alizarine Blue G.
1 lb. Fast Chrome Violet B W.
(C. Bischoff & Co., 88 Park Pl., New York.)
5 lbs. Acetic Acid.

Dye at a boil until the bath is exhausted.

The Fast Chrome Violet B W should be dissolved in lukewarm water and not in boiling water.

The blue produced in this way possesses excellent fastness to light, washing and the common color destroying agencies.

Recipe No. 125.

Blue on Worsted Yarn.

Compound shade of blue on 100 lbs. worsted yarn. First mordant the yarn in a bath made up with

3 lbs. Potassium Bichromate.
2 lbs. Lactic Acid.

Enter yarn at 140° F. and boil from 1 to 1 1/2 hours. Lift, rinse, and then dye in a bath made up with

3 lbs. Domingo Alizarine Blue R.
1 lb. Fast Chrome Violet B W.
(C. Bischoff & Co., 88 Park Pl., New York.)
5 lbs. Acetic Acid.

Dye at a boil until the bath is exhausted.

The Fast Chrome Violet B W should be dissolved in lukewarm water and not in boiling water.

The blue produced in this way possesses excellent fastness to light, washing and the common color destroying agencies.

Recipe No. 126.

Red on Cotton Yarn.

Tetrazo Red B on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Tetrazo Red B.
(American Dyewood Co., 156 William St., New York.)
5 lbs. Soap.
30 lbs. Glauber's Salt.

Enter the yarn and dye at a boil for one hour.

Then diazotize by working in a cold bath made up with

2½ lbs. Sodium Nitrite.
7½ lbs. Hydrochloric Acid.

Then develop by working 1/2 hour in a cold bath made up with

1 lb. Beta Napthol.
1 lb. Caustic Soda Solution, 75° Tw.

Wash well and dry.

Tetrazo Red B may be used as a direct dyeing color and when diazotized and developed as above, a red shade is produced which is much faster to light than Primuline. The development also increases its fastness to acids and washing.

Recipe No. 127.

Navy Blue on Worsted Yarn.

Azo Navy Blue B on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Azo Navy Blue B.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 160° F. and dye at boil for one hour.

Instead of Glauber's salt and surphuric acid, 20 lbs. of bisulphate of soda may be used.

Azo Navy Blue B will be found of value in the coloring of dress goods and in yarn dyeing, particularly with yarn which is to be used for knitting. It possesses very good fastness, is of low cost and combines well with other acid colors. It leaves white cotton and white artificial silk unstained.

Recipe No. 128.

Green on Cotton Yarn.

Chlorozol Brilliant Green G on 100 lbs. bleached cotton yarn. Prepare the dye bath with

2 lbs. Chlorozol Brilliant Green G.
(Read, Holliday & Sons, 7 Platt St., New York.)
30 lbs. Common Salt.

Dye one-half hour at the boil.

Chlorozol Brilliant Green G possesses very good leveling and calendering powers and is reasonably fast to light and washing. On mercerized cotton the shades come up much yellower.

The silk production of the world is valued at $268,000,000 of which China produces about one-third, with Italy, India, France and Japan following in the order named.

In the early history of the wool trade in England it was desired to stimulate the manufacture of woolen goods, and to this end it was decreed that the dead should be wrapped in woolen coverings. It was reasoned that "there dyes in England an Hundred and Fourty Thousand yearly: and we will allow four Pounds of Wool for a Shrowd which amounts to Five Hundred and Sixty Thousand Pound of Wool yearly buried." The law was a failure, however, for linen and cotton continued to be used for that purpose.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Griffin. The name of the new mill to be started in the plant formerly operated as the Griffin Knitting Mill will be "The Central Mills." Capital stock is $100,000. They are now installing machinery, 150 Dobby looms (ordered from Lowell Machine Shop) and are not at present in the market for any additional machinery.

*Massachusetts, Taunton. The Old Colony Mills have been organized with capital stock of $150,000, to take over property of the Watuppa Mills. Arthur M. Alger of Taunton will be president of the new company and Clark W. Holcomb, temporary treasurer. The building now has capacity of 800 looms.

Mississippi, Macon. The Noxubee Cotton Mills have been incorporated with capital stock of $100,000, by W. T. Hubbard, A. M. Tynes, and R. L. Anderson, of Shuqualak. They will operate a plant making yarns, twines, bats, etc. The Old Hashuqua Mills, long idle, will be remodeled, new buildings erected, and dyeing and drying machinery installed.

Pennsylvania, Philadelphia. Andrew Y. Michie, late loom-fixer with John M. Schwehm & Son, Germantown, has started up 10 looms on hair cloth at 2d and Diamond Streets, which he is selling direct. He uses No. 36 cotton yarn.

Pennsylvania, Philadelphia. Messrs. William Hooks & Co. have recently started up a plant for the manufacture of Turkish towels, which they are selling direct from their factory at 4300 North Franklin St. They are now operating three looms, but from the amount of orders which they are receiving they claim that it will be necessary to increase the size of their establishment in a short time. William Hooks has charge of the plant and does the buying. They are using 14's and 30's single cotton yarns. The plant is run by steam.

*Pennsylvania, Sellerville. The Armure Tapestry Mills, capitalized at $80,000 (to increase to $160,000) will start operations in their plant here about November 1st. They will operate 54 broad looms, making upholstery goods. Albert Mitchell is president of the company; David Mitchell, treasurer; James Brooks, agent, and James Kerr, superintendent. A dye house will also be attached. Goods are sold direct.

The Nekomis Cotton Mills, Lexington, N. C., are now receiving large shipments of cotton machinery. This machinery, which includes pickers, cards, speeders and spinning frames, was recently ordered from the Howard & Bullough American Machine Co., Pawtucket, R. I.

*South Carolina, Marion. The Marion Manufacturing Co. has started operations in their new plant. Although the plant was built to accommodate 7,500 spindles, they will start with but 5,000, the additional 2,500 to be installed later.

*South Carolina, Spartanburg. The Jordan Manufacturing Company will soon start operations in their new mill, making towels and quilts.

*South Carolina, Yorkville. Work has begun installing the machinery in the Neely Yarn Mill.

Enlargements and Improvements.

Connecticut, East Hampton. Work has been started replacing the Summit Thread Company's old boiler with a new one of 150 h. p.

*Connecticut, Willimantic. The improvements at the Willimantic Cotton Mills have been somewhat delayed owing to recent death of Mr. Rowell, the selling agent. As soon as matters can be arranged, work will proceed.

*Georgia, Dublin. Work was started July 1st on the new addition for the Dublin Cotton Mills. They will install 3,120 spindles, which they contemplate having in operation by January 1st. This pant has present equipment of 4,992 ring spindles and 260 looms, making plain coarse sheetings.

*Georgia, Fitzgerald. The Fitzgerald Cotton Mills have started work on addition to their mill and expect to have same completed by September 1st, when they will have a total of 10,000 spindles, making yarns, 10s to 16s.

Maryland, Baltimore. The Cotton Duck Company will expend a large amount in improving the various plants, by replacing considerable of the old machinery with new, etc.

Massachusetts, Adams. The Renfrew Manufacturing Company has purchased 98 of the Johnson-Dunbar Mills looms, four quillers and two hot presses, which will be installed in their mills; the looms and quillers in the Jacquard mill and the presses in the lower gingham mill.

The Lorraine Mfg. Co., Westerly, R. I., have placed a repeat order for revolving flat cards with the Howard & Bullough American Machine Co., Pawtucket, R. I.

*Massachusetts, Fall River. The work on the new mill for the Fall River Iron Works is progressing rapidly. The foundation for the new chimney, which will be 280 feet high, has been put in. When building is a little further under way, work will be started tearing away the slate barn roof on the Metacomet Mill, and which will be replaced with a flat roof and an additional story. Additional machinery will be installed in this mill also.

Massachusetts, Fall River. The Conanicut Mills are installing 50 new automatic (Geo. W. Stafford) looms in the plant.

Massachusetts, Griswoldville. An addition is being built to the bleachery of the Griswoldville Manufacturing Co.

Massachusetts, Hebronville. A four story addition, 50 by 60 feet, is under construction for the Hebron Mills. The spinning frames and cone winding machinery will be removed from the old plant and installed in the new. It is expected to have same completed about October 1st.

Massachusetts, Lancaster. The Lancaster Manufacturing Co. is to build an addition to the cotton yarn mill at Ponikin. The new building will be 200 by 62 feet, two stories, brick, to be used mostly for spinning.

Massachusetts, Lawrence. The Lawrence Duck Co. is making important changes and improvements to the plant. A large addition, being built to the main building, will be equipped with a 225 h. p. gas engine to be used as an auxiliary to the water wheels.

Massachusetts, New Bedford. The Potomska Mills have recently installed 25,000 spindles in the plant.

Massachusetts, Webster. S. Slater & Sons have installed 4,800 new spindles in their cotton mill.

*New York, Utica. The Utica Steam & Mohawk Valley Cotton Mills will start work as soon as possible on new addition to the plant. They propose having same completed by January 1st, and will add from 20,000 to 25,000 ring spindles and 200 to 300 looms. This plant makes sheetings and shirtings and yarns, 10s to 40s.

*North Carolina, Bessemer City. We have been advised by the Bessemer City Cotton Mills that they contemplate beginning erection of building in early fall.

The Aurora Cotton Mills, Burlington, N. C., are installing additional machinery received by them from the Howard & Bullough American Machine Co., Pawtucket, R. I.

North Carolina, Lumberton. Ground is being prepared preparatory to starting work on the No. 2 mill for the Lumberton Cotton Mills. When completed this plant will have a total of 18,000 spindles.

*Pennsylvania, Philadelphia. Work is well under way on the new addition for the Orinoko Mills. A large addition, 52 by 44 feet, has recently been completed to the dyehouse.

*Pennsylvania, Wilkesbarre. The Wyoming Valley Lace Mills have completed addition to the plant.

The Manville Co., Manville, R. I., who are making extensive replacements in their machinery equipment, have placed their order for drawing frames with the Howard & Bullough American Machine Co., Pawtucket, R. I.

*Rhode Island, Pawtucket. At meeting held recently by the Royal Weaving Company, it was voted to increase the capital stock from $1,000,000 to $2,000,000.

*Rhode Island, Valley Falls. Work has been started on building new plant for the Frank Wood Manufacturing Co. It is proposed to have the new building completed about Nov. 1st. They will add 24 new looms, for making fancy tapes. Manning Wood is president of this company; Frank Wood, treasurer and William Hinchliffe, superintendent.

Rhode Island, Westerly. The old stock house of the William Clark Company is being torn down preparatory to erecting a new three story brick building for same purpose.

Mills Starting Up.

*Alabama, Oxford. The Blue Springs Cotton Mill has resumed operations. L. J. Cochran is superintendent of the mill.

*Delaware, Wilmington. The Delaware Cotton Co., which was recently started up after being shut down for a time has for its general manager Benjamin O. Race, who is also superintendent and president of the Manchester Finishing Works of Philadelphia. The mill is now running full on dress goods and fancy shirtings on 600 looms which are sold through New York and Baltimore. It is their intention also to start up the dye and finishing department within a short time. The spinning department, in which they operate 14,498 ring spindles, is still out of commission and they state that they do not know when they will start it up again. They are buying yarns from 8's to 100's.

*Georgia, Eastman. The Eastman Cotton Mills will resume operations about October 1st making domestic and export sheetings. Plant will have equipment of 5,000 ring spindles and 150 Draper looms. W. N. Leitch is president of the company; W. H. Carter treasurer and S. C. Smyly, general manager.

*Texas, Denison. The Denison Cotton Mill will soon be started up. The spindles will be operated to their full capacity. Superintendent Clarke of the Bonham Mills will have charge.

Mills Shutting Down.

New York, New York Mills. The several mills, with exception of No. 2 weave room and the bleachery of the New York Mills, suspended operations July 22d for two weeks, and will resume in full August 7th. The Walcott & Campbell Spinning Co.'s mill will not be affected by the shut down.

WOOLEN.

New Mills.

*Massachusetts, Holbrook. The Commonwealth Rug Weaving Company is name of the new company recently located in the Whitcomb & Paine factory. They expect to have three of the looms in operation shortly, making specialty of converting carpets into rugs.

Massachusetts, East Brookfield. William G. Keith has leased the Esther shoddy mill and after making extensive repairs to the plant, is about ready to start operating same on woolen shoddy. William E. Ballem will be superintendent and manager of the plant.

*Massachusetts, Springfield. F. C. Newton is president of the American Oriental Rug Company, recently reported started at this place and Eugene E. Sykes, treasurer.

*New Jersey, Trenton. Messrs. John W. Nary and Arthur Schwarz, reported to start new mill at Providence, R. I., have purchased the Alryan Mill at this place and will dispose of the present machinery. The plant will be repaired and 60 new worsted looms installed for making fancy and piece dye worsteds. They will start operations in September. A new dye house will be built.

New Hampshire, West Lebanon. A carding and spinning mill is being established here by the Ottaquechee Woolen Co., of North Hartland, Vt. It is expected that the plant will be in operation before August 1st, and will run night and day. Equipment comprises 2 sets cards, 2 mules and a 75 h. p. boiler and engine.

Enlargements and Improvements.

California, Santa Rosa. It is expected that the Santa Rosa Woolen Mills, which have been undergoing repairs, etc., will be ready to resume operations in about two weeks. New machinery is being installed for making flannels in addition to woolen goods now manufactured.

*Connecticut, Norwich. The Glen Woolen Mills have started work on new storehouse to replace one recently destroyed by fire. They are also installing 25 new looms in the plant.

Connecticut, Norwich. The Reliance Worsted Company is installing additional machinery in the plant. The spinning department is being operated nights.

*Connecticut, Rockville. Contractors are now figuring on the plans for new building, 101 by 72 feet, for the Jas. J. Regan Manufacturing Co.

Maine, Dexter. The new building to be built by the Amos Abbott Company will be 100 by 61 feet, brick, and will be used for dye house and picker room.

*Maine, North Vassalboro. An addition, 200 by 47 feet, will be made to the main building of the American Woolen Company's plant, in addition to the erection of the new dye house.

Maine, Oakland. The Cascade Woolen Mill was closed for the past week for purpose of making necessary repairs.

Maine, Oxford. The Robinson Manufacturing Company is installing a new 50 h. p. steam engine in the plant for use when water power gives out.

Maine, Skowhegan. The Maine Spinning Company is to double the capacity of the plant, new drawing, spinning and twisting machinery to be installed at once.

*Maine, Springvale. The Maine Alpaca Company has nearly completed work on the new addition, which will be utilized for spinning purposes.

Massachusetts, Caryville. A new 350 h. p. boiler is soon to be installed in the Caryville Mill, also 2 sets of new cards (ordered).

Massachusetts, Franklin. A three story addition, 54 by 45 feet, is under construction for the Franklin Yarn Co. Spinning and carding machinery will be installed. It is expected that same will be completed in about six weeks.

Massachusetts, Graniteville. The Abbott Worsted Co. is building another story to the mill.

Massachusetts, Holden. A new dye house is being built by the Dawson Manufacturing Company, to replace the old one. The new building will be 50 by 50 feet, one story. The shipping room will be removed to the new building and space vacated by that department will be utilized as machine shop.

Massachusetts, Hubbardston. An addition, 24 by 48 feet, will be built to the Hygienic Blanket Company's dye house.

Massachusetts, Lawrence. The American Woolen Company is to erect a new dye house, 100 by 500 feet, one story, on property adjoining the Washington Mill. It is expected to have the new dye house completed before winter.

Massachusetts, Lowell. The Musketaquid Worsted Company, which is running with a night and day force, has installed four new looms in the plant.

*Massachusetts, North Chelmsford. Work is nearly completed on the new building, 82 by 326 feet, four stories, for the Geo. C. Moore Wool Scouring Company. New machinery is being installed.

*Massachusetts, Millbury. Work has been started on foundations for another extension to the Bowden Felting Mills. The new building will be 58 by 52 feet, brick, and will be located on site now occupied by the old buildings formerly known as the Millbury Foundry and used recently by the Bowden Felting Co. as storehouse. An annex will also be built to the main building for an electric light plant.

Massachusetts, Monson. A 500 light plant and two fulling mills have recently been installed in S. F. Cushman & Sons' mill.

*Massachusetts, Palmer. Work has been completed on the addition to the Grosvenor Woolen Company's dye house.

Massachusetts, Plymouth. Twenty looms have recently been installed in the Standish Worsted Mills.

*Massachusetts, Spencer. Dufton Bros. have purchased the old pottery at East Brookfield, and will remove same to Westville, where it will be remodelled and replace their satinet mill destroyed by fire last January.

*Massachusetts, Watertown. Work has been nearly completed on the new three-story addition to the Aetna Mills. They will install 60 new looms (ordered) and possibly put in additional finishing machinery.

*Massachusetts, Worcester. The new building under construction for the M. J. Whittall Carpet Mill is for storage and sorting building only.

New Hampshire, Claremont. A Roberts & Co. are to enlarge their mills with an addition, 140 by

60 feet. They will install a new set of cards and a 288 spindle mule.

*New Hampshire, Enfield. The American Woolen Co. has started work on rebuilding storehouse recently burned. The new building will be 100 by 50 feet. They have also started work on foundation of new boiler house and carbonizing plant.

*New Hampshire, Guild. Work has been completed on the new addition to the Fairbanks & Dorr plant, and machinery is being set up as soon as received. They have installed more carding and spinning machinery than was first intended.

*New Hampshire, Newport. Work is well under way on the new mill for Dexter Richards & Sons. It is thought that the plant will be ready to start up by November 1st.

New Hampshire, Somersworth. The Great Falls Manufacturing Company is raising No. 2 mill two stories and will complete same as soon as possible.

*New York, Albany. A new shoddy mill will be erected this fall by Wm. Barnet & Son, more than doubling capacity of the present plant.

New York, Amsterdam. An eight-story drying tower is being erected for the carpet mills of S. Sanford & Sons on Willow Street. The dimensions of the tower are 30 by 27 feet, composed of brick, five stories of the operation having already been completed. The tower is to be used for the purpose of drying the carpets after coming from the drum room. This concern manufactures Axminster, Brussels, Tapestry, Velvet, Mohair and Moquette carpets, operating 46 sets, 14 combs, 5,000 spindles, 40 cotton cards and 350 looms, with a dyeing and printing department.

*Nova Scotia, Hewson. The Hewson Woolen Mills, which have lately been increasing the plant, now have equipment of 6 sets cards and 25 broad and 10 narrow looms.

Pennsylvania, Downingtown. The Rockstone Mills Co., under the management of Mr. Thomas F. Nutt, has passed through a very busy season operating 3 sets and 60 looms on fine woolens which they are selling through New York. The mills are now shut down for the purpose of making repairs to machinery, etc., before starting up again on their new samples, which will be in the course of a week or two. Mr. George W. Vickery is now the superintendent in charge of the plant, having succeeded Charles Green. They do their own dyeing.

Pennsylvania, Lenni Mills. The Yorkshire Worsted Mills have acquired an annex in which they will operate 105 additional looms, giving them a total of 305.

Mills Starting Up.

Connecticut, Norwich. The Clinton Mills will close Saturday, July 29th, for two weeks, as usual, for vacation and to make necessary repairs and improvements to the plant.

*Maine, North Dexter.. The North Dexter Woolen Mill, recently reported purchased by A. P. Abbott and R. E. Lattimer, will be managed from the office of Amos Abbott & Co., but will be operated as an independent concern and not as a branch mill. The carding and spinning departments are now running.

*Massachusetts, Clinton. Operations have begun in the Earnsdale Worsted Mill, W. V. Brodmerkle, proprietor. This plant is equipped with 17 looms.

New Jersey, Gloucester. The Fries-Harley rug mill, which has been shut down for about a week, has again resumed operations and is running full time.

*Oregon, Eugene. Operations are reported to start about October 1st in the woolen mill recently secured by Wilbur & Wright of Union. From 75 to 100 people will be employed.

Mills Shutting Down.

Connecticut, Yantic. The Yantic Woolen Mills have been closed for three weeks. During idleness a 250 h. p. engine (ordered) will be installed.

Massachusetts, Rutland. Operations will be suspended in a few weeks in the woolen mills for purpose of installing a new boiler.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Putnam. The Silk Fibre Co., recently reported incorporated, is capitalized at $50,000. Frederick B. Hays is president of the company; Dexter Elliott, treasurer, and Thomas Park, superintendent. They expect to start operations in August, making Italian silk blankets, etc. Plant will be equipped with 12 looms at start. Later a dye house will be installed.

*Georgia, Augusta. The Murray Silk Mills, formerly known as the Isaetta Mills, but which have been completely remodeled, are about ready to start operations.

*Massachusetts, Hopkinton. It is reported that the Herminia Silk Co. will start operations about October 1st manufacturing broad silks for dress goods. The machinery has been ordered and will be installed as soon as it is ready.

New Jersey, Dover. George Singleton, who is operating silk throwing plants in Dover and Paterson, N. J., and Wadesboro, N. C., has just started up another plant in the old nail factory at Oxford, N. J., and is about to start up a plant at Augusta, Ga., where a building has been secured and will be equipped with machinery for the same purpose.

*New York, Canisteo. The new building for the Canisteo Silk Mill has been completed and the machinery will be installed as soon as possible. It is expected that the plant will be ready to start operations September 1.

*Pennsylvania, Bangor. The Crown Silk Company will start operations October 5th, making silk gloves. This company has capital stock of $50,000. Jacob Raub is president of the company; Ellwood Hay, treasurer and Jacob Thissen, superintendent. The plant will have equipment of 2,000 spindles and 4 looms and will also have dye house attached.

Pennsylvania, Bangor. The Bangor Silk Company has made application for a charter. W. R. Thomas, Jr., of Catasauqua and A. S. Baker and

S. Jerman of Scranton, are interested. They propose erecting a new building, 125 by 50 feet, with boiler and engine room separate.

Pennsylvania, Catasauqua. The new plant of the Corty Velvet Mill is to start up shortly.

*Pennsylvania, East Plymouth. Work was begun on erection of the new silk plant for Bleckley Bros., who will operate same under name of the Luzerne Silk Co. They expect to have the plant ready to start up by November 15th. Details later.

Enlargements and Improvements.

Connecticut, Rockville. The Belding Silk Mills are to be closed for a few weeks for purpose of installing new boilers and making other improvements to the plant.

*Connecticut, Willimantic. The Windham Silk Co. will start work this coming fall on erection of a new mill. They will increase the number of looms to 300, for making dress and lining silks. Company is capitalized at $100,000. Hugh C. Murray is president of the company, Wm. P. Jordan, treasurer, Lyman A. Nichols, superintendent, and C. Fenton, secretary and general manager.

Michigan, Belding. Fifty new looms are being installed in the Belding Silk Mills.

New Jersey, Paterson. It is expected that the new building for the Manhattan Silk Co. will be ready for occupancy the latter part of September.

*Pennsylvania, Kutztown. Additional looms and other machinery have been installed in the Kntztown Silk Mill, operated by the York Silk Co.

Pennsylvania, Scranton. Work is well under way on an addition to the Providence Silk Mill.

*Rhode Island, Central Falls. It is reported that the Leader Weaving Company, which has started with 50 looms, is negotiating for larger quarters for purpose of operating 100 additional looms.

Mills Shutting Down.

Delaware, Wilmington. The Reliance Mills Mfg. Co., which was started up about a year or so ago with a capital of $20,000 and F. Ahrens, pres., and Herman Ahrens, superintendent, for the manufacture of novelties in mercerized and silk goods, is shut down with no prospect of being started up again. The equipment of the plant consisting of 32 looms is for sale.

Massachusetts, Canton. The Eureka Silk Mill has been closed for two weeks.

Pennsylvania, Carlisle. The Carlisle Silk Mill has been closed for purpose of making repairs to some of the machinery.

Pennsylvania, Scranton. The Peckville Silk Mill has been closed owing to trouble with the operatives.

MISCELLANEOUS.

New Mills.

*Massachusetts, Barrowsville. Work is progressing rapidly at the Barrowsville Bleachery, and it is expected will be ready for occupancy before fall.

New York, Utica. The Erie Dyeing Company has been incorporated for bleaching and dyeing yarn. The capital stock is placed at $10,000. John Shuttleworth (Amsterdam) and Clarence J. Broadbent (Utica) are interested.

*Pennsylvania, Allentown. Work is well under way on new building for the Liberty Silk Dye Works. A new boiler house has been built and four large boilers set up.

Rhode Island, Woonsocket. The Woonsocket Dyeing & Bleaching Co. has been incorporated with capital stock of $10,000. Gustave Frederichs is president and general manager of the plant and Charles Proulx, secretary and treasurer.

Enlargements and Improvements.

Massachusetts, Lawrence. The Lawrence Dye Works Company proposes enlarging the present plant by an addition 250 by 60 feet, three stories, brick. The new space is to be utilized for dyeing and finishing.

*Massachusetts, Ludlow. The new building recently reported under construction for the Ludlow Manufacturing Associates, is for packing room, with storehouse adjoining, simply to facilitate shipping.

Massachusetts, Taunton. The Taunton Bleacheries & Dye Works Co. has installed a new boiler in the plant.

New York, Chadwick's. A new two story building, 108 by 50 feet, brick, is under construction for the Utica-Willowvale Bleaching Co. The lower floor will be used for carpenter shop and the upper one for storage purposes. It is expected that same will be completed September 1st.

*Pennsylvania, Philadelphia. The Hulton Dye & Finishing Works have recently completed erection of a new building to the plant, greatly increasing capacity.

Wisconsin, Eau Claire. General repairs are being made to the Eau Claire Linen Mill.

Mills Starting Up.

*Pennsylvania, Allentown. The Allentown Spinning Co., whose mill has been shut down for several weeks on account of a strike, has again resumed operations, a compromise having been made with the operatives. This concern manufactures jute carpets and rug yarns and twines on 6,110 spindles.

FAILURES AND SUSPENSIONS.

New York, New York. The Castle Braid Company, 552 Broadway, is in financial difficulties, and Emanuel W. Bloomingdale has been appointed receiver. The liabilities are estimated at $30,449, with nominal assets of $348,706, against which there are mortgages and other liens of $115,079.

North Carolina, Graham. The Voorhees Manufacturing Co. has been placed in the hands of receivers. J. V. Pomeroy and Charles A. Scott have been appointed temporary receivers. The company's liabilities are estimated at $45,000. It is thought that the company will be reorganized.

Pennsylvania, Philadelphia. Constantine J. O'Neill and Andrew P. Cooney, who have for many years been operating 21 looms on damasks and lap robes at 1543 Ruan Street, Frankford, have

been adjudged bankrupts. The plant has been shut down for some time and it is now understood that it will not be started up again. They operated under the name of O'Neill & Cooney.

FIRES.

Connecticut, Mystic. The Mystic Woolen Company's plant was damaged by fire which started in the carding room. Loss is placed at about $1,000. Work has been suspended pending repairs.

Kentucky, Louisville. The Mayfield Woolen Mills were damaged by fire, which originated in the press room. The loss (which is covered by insurance) is placed at about $1,500, due principally to water.

Mississippi, Columbus. The Kavanaugh Mill has been damaged by fire recently. The loss is placed at about $2,500.

New Jersey, Camden. A fire of incendiary origin destroyed the large worsted spinning plant of George Shimer & Son, 5th and Erie Sts., the damage being placed at $50,000. They operated 3 worsted cards, 3 combs and 2,400 spindles.

New Jersey, Montville. A large building used by John Capstick's Sons, bleachers, dyers and printers, has been destroyed by fire. The loss is placed at $30,000 on building and contents.

New Jersey, Paterson. Krayer Bros.' plant, located in building at 35-37 Fair Street, has been damaged by fire which occurred in building recently. The loss is covered by insurance. The Consumers' Silk Co., also in same building, suffered water damage.

New York, Cohoes. The National Textile Company's plant has been damaged to the extent of about $1,200 by fire which started in the picker room.

North Carolina, Malee. The Malee Knitting Mills have been destroyed by fire. The loss estimated at $10,000, is partially covered by insurance. Nothing definite has yet been decided about rebuilding.

North Carolina, Siler City. The Hadley-People's Manufacturing Co.'s cotton warehouse and about 250 bales of cotton were destroyed by fire July 4th. The loss, estimated at $12,500, is covered by insurance.

Pennsylvania, Manheim. The Manheim Hosiery Mill, H. H. Shenck, proprietor, was damaged by fire. The loss is placed at about $3,000, principally to stock and fixtures.

Pennsylvania, Philadelphia. Rudolph Blankenburg & Co.'s Olympia Mills at 24th and Ellsworth Streets was recently damaged by a slight fire originating through spontaneous combustion to the extent of $500.

Pennsylvania, Philadelphia. A fire originating in the picker room of Frederick Lord's carpet yarn mill at 2838 Terrace St., Manayunk, damaged the plant to the extent of $500 on Wednesday night the 5th inst.

FACTS AND GOSSIP.

Connecticut, Norwich. It is reported that a company with capital of from $200,000 to $300,000 proposes establishing a large plant here.

Connecticut, Norwich. The Norwich Silk Company's mill was wrecked on the 24th inst. by explosion of the boiler.

Connecticut, Plainfield. It is reported that a new company is to be formed with capital stock of $300,000, to establish a cotton mill here. Messrs. Lawton and Sayles are mentioned as interested.

Delaware, Dover. Post & Sheldon's Silk Mill, in which they operate 114 looms on broad silks, is very busy. The plant, which is located on South State St., is under the superintendency of Jeremiah Shatwell, who has had long experience in this line of work both in Europe and America.

*Delaware, New Castle. It is reported that the Fort Casimir Woolen Mills, which has been shut down for a year or more, will be started up again in the near future under the management of new parties who have been in the town looking over the mill with that idea in view. The mill formerly run on fancy wool cassimeres and cotton warp piece dyes, operating 8 sets, 300 looms and a dye house.

Delaware, Wilmington. John Hand & Sons' mill is very busy. They are operating 4,000 spindles and 200 broad looms on thrown and dress silks and have put in 24 narrow looms which they are running on ribbons. Mr. R. K. Dunkin is the superintendent.

*Georgia, Barnesville. At meeting held recently of the stockholders of the Aldora Mills, H. R. Robertson was elected president, J. L. Kennedy, vice president and general manager and George W. Heard, secretary and treasurer. Company is capitalized at $125,000.

*Kansas, Topeka. We have been advised by the Topeka Woolen Mill Co. that their mill was sold to the Hersberger, McAfee Woolen Mill Co., of Kansas City, Mo., last January. The plant is still idle and there is no definite information about it being merged with other interests in Kansas City, although there is some such movement on foot.

Maine, Dexter. The Morrison Woolen Company is planning to start two shifts of help at work in the mills.

*Maine, Pittsfield. Gordon Dobson is president of the Robert Dobson Co., recently reported incorporated to continue the plant of Robt. Dobson & Co. Samuel R. Haynes, treasurer and general manager, and F. W. Briggs, superintendent. This plant is equipped with 16 sets cards, 80 broad looms, dye house and operated by steam and water power. Goods are sold through Greeley, Cushman & Record.

*Maryland, Baltimore. The Consolidated Cotton Duck Company has been prematurely organized to take over the Mt. Vernon-Woodberry Duck Company and the United States Cotton Duck Corporation. Davies Warfield is chairman of the board; C. K. Oliver, president; D. H. Carroll, vice president and treasurer; H. L. Smith, assistant treasurer and C. S. Green, assistant secretary.

*Massachusetts, Canton. The Eureka Silk Manufacturing Company has been incorporated with capital stock of $400,000, to operate the plant of the Eureka Silk Co. at this place. T. King is president of the company, Geo. A. Hammond, vice president, and C. C. Knowlton, treasurer. The company's New York office is at 817-819 Broadway.

Massachusetts, Hinsdale. The carding and spinning departments of the Hinsdale Woolen Company's mill is running nights.

Massachusetts, Lawrence. The Pacific Mills are to close from August 25th until after Labor Day.

Massachusetts, Lowell. It is reported that F. A. Dutton, who purchased the Waukenhose Manufacturing Co.'s plant and is operating same as Waukenhose Knitting Co., will form a new company in about a month to operate the plant. W. A. Eastman, operating a small knitting plant, will also be interested.

Massachusetts, Mansfield. The Wadsworth Braiding Company has leased a large portion of the Mansfield Braiding Company's plant and will remove their plant now at Providence, R. I., to this place about August 1st.

Massachusetts, Millbury. The Bowden Felting Mills are operating the plant with a night force.

*Massachusetts, New Bedford. The New England Cotton Yarn Company, which has practically acquired all of the capital stock of the Lambeth Rope Corporation, par value $50,000, will operate the mill as part of their plant.

Massachusetts, New Bedford. The Oneka Mills are changing their product from dress goods to men's wear.

*Massachusetts, North Adams. The sale of the machinery, etc., of the Johnson-Dunbar Mills has been concluded. About $25,000 was realized by sale. Some of the machinery was purchased by C. W. Dennett of South Hadley Falls.

Massachusetts, Pittsfield. A. H. Rice & Co. have been incorporated with capital stock of $90,000. William B. Rice is president of the company and Arthur H. Rice, treasurer.

Massachusetts, Rockport. It is reported that a net and twine factory is being contemplated at this place.

*Massachusetts, Salem. Nothing has yet been done regarding the plant of reorganization by the Naumkeag Steam Cotton Mills. At present it is merely talk among the directors.

Massachusetts, Spencer. E. G. Gibson has removed his shoddy mill at East Brookfield to building on West Main Street, between East Brookfield and Spencer.

Michigan, Rochester. The Rumsey Wool Stock Co. have completed their new building and as soon as the machinery is installed will resume operations in full.

*Mississippi, Yazoo City. The Yazoo Yarn Mill has been incorporated with capital stock of $65,000. This company will operate the Yazoo Cotton Mills, recently reported to be reorganized.

New Jersey, Elizabeth. By a final decree filed in the court of chancery in foreclosure proceedings, the receivers of the standard Rope & Twine Company have been directed to sell their property at this place.

New Jersey, Jersey City. The Hall Lace Co. has been incorporated with capital stock of $100,000 for manufacturing laces, veilings, nets, etc. Thomas H. Hall, Geo. C. Tennant and Thomas G. Haight are mentioned as interested.

*New Jersey, Mount Holly. The Taylor Silk Co., of Paterson, is negotiating with parties for removing their Scranton mill to this place.

New Jersey, Paterson. The Speirs Silk Co. has been incorporated with capital stock of $100,000 by Robert Speirs, William H. Smith and John A. Stewart.

New Jersey, Paterson. The Walthung Silk Dyeing Company has been incorporated with capital stock of $60,000. John Walton, Jr., and William H. Young are among the incorporators.

New Jersey, Paterson. The New Process Dyeing & Finishing Company has been incorporated with capital stock of $100,000 by Robert Swinley, and others.

New Jersey, Paterson. It is reported that Newark capitalists are to build a plant for manufacturing laces and embroideries, on Vreeland Avenue.

*New Jersey, West New York. Plans have been prepared for a new building, 100 by 50 feet, for the Sutro Bros.' Braid & Silk Co. It will be equipped with all the latest improved machinery.

New York, Albany. The John M. Crapo Company has been reported incorporated with capital stock of $10,000, for purpose of manufacturing linens, silks and velvets. J. Crapo (Albany) and L. D. Hickox, Chicago, are interested.

New York, Brooklyn. The property of the John Good Cordage Machine Works has been sold to Schwab Bros., manufacturers of plumbers' supplies.

*New York, Frankfort. The property of the Mohawk Valley Woolen Company has been purchased by four of the former stockholders of the company and Utica capitalists. The new company will continue the plant under old name, with capital stock of $100,000. Operations will be resumed before long.

*New York, New York. The property of the Southern Textile Company was sold at auction by Charles Shongood, by order of Walter C. Cabell, trustee in bankruptcy. The three cotton mills, with machinery, were first sold separately and then as a whole. The Windsor Mill at Burlington was sold to Robt. L. Holt for $25,000; the Chicora Mills, Rock Hill, S. C., to N. M. Smith for $34,000, and the Moorhead Mills to Mr. Holt for $36,000. All the above property was then put up in one lot and sold for $110,500 to the International Trust Co. of Baltimore. The bulk sale accepted by the trustees realized $15,500 more than the separate lot sale, and will be submitted to the United States District Court for confirmation. Some merchandise materials and supplies were purchased by T. A. Blythe, of Philadelphia, for $3,600, who claims a factor's lien on the goods.

New York, New York. The United Manufacturing Trimming Company has been incorporated to manufacture thread and cotton tape trimmings. Capital stock is placed at $25,000. Jacob Fix and Alexander Feinburg of New York are mentioned as interested.

Personals.

Cotton.

J. J. Bradley of Whitmire, S. C., has accepted the position as agent for the Merrimack Mills of Huntsville, Ala.

F. C. Graddeck of Darlington, S. C., has succeeded John Dockey as superintendent of the Scotland Mills, Laurinburg, N. C.

Ernest J. LeFort, second hand of dyeing at the Otis Company's mills, Ware, Mass., has resigned to go to Greensboro, N. C., to take charge of dyeing in a new mill there.

William K. Sawyer has accepted the position as designer for the West Boylston Mfg. Co., Easthampton, Mass., Mr. Hargraves having resigned.

Thomas Clegg, for many years secondhand of the spinning department of the Berkeley Mills, Woonsocket, R. I., has resigned, to accept a similar position at the Nourse Mills in this city. George Perkins, secondhand of the Linwood Mill at Whitins, Mass., will succeed Mr. Clegg at the Berkeley Mill.

David Kelly has completed his duties in the upper mill at Peck's, Pittsfield, Mass.

J. R. Killian, president and general manager of the Whittaker Cotton Mills, Blacksburg, S. C., manufacturers of hosiery yarns and high grade hosiery, has tendered his resignation, to take effect as soon as a competent man is secured to take his place.

Edward J. Barry, for years overseer of the weaving department of the Pemberton Mills, Lawrence, Mass., has resigned.

J. L. Blair has resigned as sperintendent of the Trion (Ga.) Manufacturing Co. Carl Thompson, formerly superintendent of the Norris Cotton Mills, Cateechee, S. C., succeeds him.

F. S. DuPre, who for several years past has been connected with the Delgado Mills, Wilmington, N. C., has resigned his position in order to go into the cotton milling business in South Carolina. He will be succeeded by G. C. Greer.

George T. Marshall, superintendent of the Merrimack Mfg. Co., Huntsville, Ala., has resigned, and J. J. Bradley has been appointed to succeed him.

Otis G. Lynch, after 25 years' service as superintendent of the Enterprise Manufacturing Co., Augusta, Ga., has resigned. He is succeeded by his son, George T. Lynch.

E. M. Bird has been appointed superintendent of the Whitaker Cotton Mills, Blacksburg, S. C., to succeed J. R. Killian.

Lawrence Haworth, who for the past 36 years has been overseer in the finishing department for the Renfrew Mfg. Co., Adams, Mass., at the lower gingham mill, has resigned his position, and will retire from active work. The company has decided to consolidate the finishing room and the packing department, and both of these departments will be in charge of William C. Ainslie, who has been overseer of the packing room for a long time.

D. L. Gore, of Wilmington, at a meeting of the directors at Bennettsville, S. C., was elected president of the Marlboro Cotton Mills, resulting from a consolidation of four large factories, with $1,000,000 capital, at Bennettsville and McColl, S. C. Mr. Gore is also president of the Great Falls Mfg. Co. at Rockingham. His duties as president of the Marlboro Mills will require his presence at Bennettsville and McColl a great portion of the time, but he will retain his residence in Wilmington, where he is president of the Gore Co., wholesale merchants, and has other private interests.

D. A. Morrell, overseer of weaving for the Exeter Mfg. Co., Exeter, N. H., has resigned, and James Garvin has succeeded him. Mr. Garvin was lately secondhand at the Massachusetts Mills, Lowell, Mass.

F. Frank Sargent, overseer of the weaving room of the Pacific Mills, Lawrence, Mass., severed his 50 years' connection with the company July 7th.

Fred Taylor has resigned his position at the Stevens Mill, Fall River, Mass., to take charge of the mule spinning at the Rotch Mill of New Bedford, Mass.

George T. Marshall, for several years superintendent of the Merrimack Cotton Mills, Huntsville, Ala., has resigned that position, and will devote some time to rest. Supt. Bradley from South Carolina, has been appointed to succeed Mr. Marshall.

W. K. Sanborn has recently begun work as assistant superintendent of the Cochrane Mfg. Co.'s mill in Danielson, Conn.

C. W. Hancock, superintendent of the Hamburger Mills, Columbus, Ga., has resigned. He was presented with a gold watch by the employes of the mill.

Harry Parker of Cedartown, Ga., is to be superintendent of a cotton mill at Montezuma, Ga.

J. J. Bradley of Whitmire, S. C., has been appointed agent of the Merrimac Mfg. Co., Huntsville, Ala.

M. C. Withey, who has had charge of carding for the Centerville Cotton Mill, Centerville, R. I., for the past four years, has accepted a position as boss carder of the Nos. 5, 6 and 7 mills of the Dwight Mfg. Co., Chicopee, Mass.

Woolen.

Charles L. Ward has resigned as overseer of the weaving department of the Rochester Woolen Co., Rochester, N. H.

D. T. Noonan has been promoted from boss weaver to designer of the Knoxville Woolen Co., Knoxville, Tenn.

G. F. Haigh, formerly designer for the Shackamaxon Worsted Co., Philadelphia, Pa., has resigned, to accept a similar position with the Globe Woolen Co., Utica, N. Y.

Fred Jackson has resigned his position in the dyehouse of the Pacific Mills to take one as assistant dyer in the Stevens Mills, North Andover, Mass.

Henry Hammond, late with the Northboro (Mass.) Woolen Co., is now overseer of carding at the Pondville Woolen Mills, Auburn, Mass.

Ceylon C. Jones, formerly with J. R. and C. W. Scott of Uxbridge, Mass., but late of Guild, N. H., has resumed his old position as overseer of finishing with the Messrs. Scott.

W. J. Welsh, formerly of Philadelphia, Pa., and engaged with Philadelphia Mills, has recently accepted the position as superintendent of the Pendleton (Ore.) Woolen Mills.

Charles H. Carter has resigned his position as superintendent of the Portland Woolen Mills, Portland, Oregon.

J. F. Brallier has accepted the management of the Seattle Woolen Mills Co., of Kirkland, Wash.

William C. Pender has resigned as superintendent of the Pondville Woolen Mill, Auburn, Mass. Mr. Pender will take a much needed rest before going to work again.

James C. Cameron has accepted the position of assistant designer for the Arkonia Fabric Mfg. Co., West Millbury, Mass.

Fred J. Maher of Mapleville, R. I., has accepted a position as second hand in the card room under J. C. Bothwell, Worcester, Mass.

William A. Theunert has accepted the position of boss spinner for the Hanover Woolen Mfg. Co., Hanover, Ill.

Ralph O. Ingram, son of Agent James Ingram of the Washington Mills of the American Woolen Co., Lawrence, Mass., has resigned his position as head of the cost department and assistant to Agent Shaw in the worsted department of the Lowell Machine Shop, and will fill a responsible position with the newly organized Shaw Machine Company of Lowell. This new company has been incorporated under Maine laws to manufacture worsted and other textile machinery. Ralph O. Ingram is a director in the new concern.

Thomas E. Ainley will have charge of carding at the new Uxbridge mill of the American Woolen Co., which is equipped with 12 sets of cards.

Fitz L. Putney will assume the position of superintendent and general manager at the Bound Brook Woolen Mills, Bound Brook, N. J., on August 1.

James A. Fagan has resigned his position as overseer of finishing at the Old Town (Me.) Woolen Co. Mr. Fagan has filled this position successfully for the past 13 years, and his departure is regretted by all who have worked with him and for him. Mr. Morganson of Sykesville, Md., is his successor.

W. H. Brogden, superintendent of worsted yarn mills for the past 12 years, has recently resigned his position with the Tingue Mfg. Co., Seymour, Conn., having filled this position for the past 16 months. Joseph Wood, who has lately been connected with the Globe Woolen Co., Utica, N. Y., has returned to his old position as superintendent of the Tingue Mfg. Co.

Albert E. Jones, formerly with G. T. Murdock & Son, New Boston, Conn., succeeds James Clavin as overseer of carding at the French River Textile Co., Mechanicsville, Conn. Jerry Daley is Mr. Jones' successor at Murdock & Son's mill.

Mitchell Bugaw, who has been overseer of finishing at F. Scott & Son's mill, Saugus, Mass., has given up mill life for that of a traveling man.

T. Dyson is the new superintendent at the Nye & Wait Carpet Co., Auburn, N. Y.

Charles Robinson, who some time ago came to the Earnscliffe Mills, Olneyville, R. I., from Fletcher's Mills as designer, has been made general superintendent of the First Nemill Mills.

Fred C. Neff is again with the Warrenton Woolen Co. of Torrington, Conn., as overseer of finishing. He held this same position in that mill about three years ago.

R. F. Hackett is the new superintendent for the Boston Wool Scouring Co. of East Boston, Mass., vice W. H. White, who has gone to Los Vegas, N. M.

William Hulme, who succeeded Edward Morrisey as overseer of the French drawing-in-room at the Atlantic Mills, Olneyville, R. I., about five months ago, severed his connection in that capacity to accept a position as superintendent of a Woonsocket woolen plant. Gilbert Kielty, who has been night overseer of the drawing-in department, was promoted to the position made vacant by the withdrawal of Mr. Hulme, and Arthur Skerrow, who has been acting as assistant to Mr. Kielty, will assume the position of night overseer.

George P. Newell, agent, and Patrick F. Whalem, assistant superintendent at the French River Textile Co., Mechanicsville, Conn., have severed their connection with the concern. Mr. Newell has located in Greenville, R. I., while Mr. Whalem and family will remain in Webster for a few weeks.

James Royce, for the past four years assistant superintendent for the American Felt Co., Glenville, Conn., has tendered his resignation, to take effect August 1st.

Edward K. Harrison has resigned as superintendent of the worsted spinning department of the Southwark Mills, Philadelphia, and been succeeded by John Hodgson, late of Bristol, R. I.

Clarence Bishop has resigned as superintendent of the Knoxville (Tenn.) Woolen Mills to accept a similar position with the Portland (Ore.) Woolen Mill. He succeeds Charles Carter. Mr. Bishop was formerly assistant superintendent of the Thomas W. Kay Mill Company, Salem, Ore., and also took a full course in the Philadelphia Textile School.

Carroll Allen of Brattleboro, N. Y., has taken a position with the American Woolen Co. as cloth inspector.

John S. Thompson has resigned as overseer of the burling department of the American Woolen Co., Beoli Mill, Fitchburg, Mass., a position which he has filled with credit for about 20 years, to enter in business for himself in Pepperell.

Michael J. Welch, for many years past employed at the E. Frank Lewis plant, Lawrence, Mass., has

accepted a position as foreman of the wool scouring department of the Boston Woolen Co.'s plant at East Boston.

Fred Jackson is the new assistant dyer at the M. T. Stevens Sons' Co., North Andover, Mass. He was formerly of Lawrence, Mass., prior to which he was assistant dyer for the American Woolen Co., Lebanon, N. H.

Miscellaneous.

Thomas Darly, a veteran calico printer at the Clyde Print Works, Riverpoint, R. I., resigned his position there recently, and will take a rest after 46 years of continuous service at the works.

Charles Steiner, the general superintendent of the York Silk Mill, York City, Pa., has resigned. John Guyer, formerly assistant superintendent, has been promoted to the vacancy.

Elliott Armstrong has accepted the position of dyer and bleacher for John E. Meyers & Co., Jamaica Plain, Mass.

Philip Mahler, for several years superintendent of the prison twine factory at Stillwater, Minn., will leave on August 1st. Mr. Mahler will continue in the manufacture of binder twine, but has not yet stated where he will go.

Thomas I. Birkin, head of the firm of T. I. Birkin & Co., Chester, Pa., who operates a large lace mill, has received the title of baronet from King Edward of England. Sir Thomas is a native of Nottingham, Eng., and he visits his Chester factory once a year.

T. J. Singer, who has been foreman of the weaving department of the Specialty Weaving Company's local mills, has been transferred to its mill at Fifty-fifth Street, New York City, where he has been promoted to a considerably more responsible position.

Deaths.

Valentine J. Brown, a well-known knit goods manufacturer, died at his home in Amsterdam, N. Y., recently, aged 65 years. Mr. Brown came to Amsterdam from Leicestershire, Eng., when 32 years of age. He located at Cohoes, where he followed the occupation of a machinist for several years. He then went to Waterford, where he became superintendent of the Hudson Valley Knitting Mills. In 1882 he removed to Amsterdam and assumed the position of superintendent of the Warner, DeForest Knitting Mills. This position he continued to hold until the death of the first-named of the firm, since which time Mr. Brown has been living a retired life.

Joseph Shaw, aged 88 years, died at his home in Norristown, Pa., on July 1. For forty years he was engaged in manufacturing woolen goods. He was one of the proprietors of the Blue Mills at Norristown, Pa.

August Fels, a woolen manufacturer and a member of the Lowell water board, died July 3d, as the result of being thrown from a carriage. He did not regain consciousness after being injured. The deceased was born in Switzerland in 1844. After two years' experience in his father's woolen mills he came to this country. He was superintendent of a woolen mill in Steventown, and later in Paterson. He came to Lowell in 1877 to become agent of the Merrimac Woolen Mills in Dracut, and was a very successful manager of this property.

John Boyle, of the firm of John Boyle & Co., manufacturers of cotton duck at 112 Duane St., New York, died on July 9th at the age of 75 years. For many years he had manufactured mail bags.

David C. O'Connor of Holyoke, Mass., an overseer in the Lyman Cotton Mills of that city, died suddenly of appendicitis at Malone, N. Y., while visiting his father.

E. Emory Johnson, a prominent cotton manufacturer and one of the best known men of Moodus, Conn., died at his home in Johnsonville, near this village, July 18th. The cause of his death was consumption. Mr. Johnson was born in Moodus, in 1841. He graduated from Union College, Schenectady, N. Y., and in 1879 he was admitted to the bar, and formerly did quite a law practice. On the death of his father, in the year 1896, he became owner of the Neptune Twine Mills, and continued in the manufacture of cotton goods until his death.

Seth H. Wetherbee, who was treasurer of the old Fall River (Mass.) Merino Company, manufacturers of underwear and jersey cloth, died at his home in Fall River recently.

Albert Stafford, former owner of the woolen mill of B. Lucas & Co., Poquetanuck, Conn., died on June 14th, at the age of 84 years.

Dr. Harrison J. Hartwell died recently at the advanced age of 76. Dr. Hartwell was among the first physicians to use oxygen treatment for pulmonary diseases. He was known to the medical world as the discoverer of compound oxygen. He was educated in Massachusetts and began his practice in Boston, moving to Philadelphia 32 years ago. About twenty years ago he became interested in the O. K. Soap Co., in which he owned controlling interest and for the past fifteen years was sole owner and the active man in the concern, which has extensive dealings with textile mills. We understand that the business will be continued by his heirs.

James Dutton, treasurer of the Dutton-Fink Silk Co., Duryea, Pa., died June 27th, after a long illness. He was 47 years of age. He is survived by his wife and one son, three years old.

William M. Spink, who was for 36 years superintendent of the Natick (R. I.) Mills, died on June 29th at his home in Cowesset, R. I. He was 79 years of age and had retired about five years ago.

Harry M. Taylor of Manayunk, Pa., was found in a clump of bushes in the woods above Shur's Lane, with a bullet through his head. Mr. Taylor, who was forty-five years old, and occupied the position of superintendent at the Freeland Mfg. Co., is known to have been in poor health for several years, but had been unable to find relief. Ill health, it is believed, was the motive for the suicide.

William B. Tustin, who has been connected with the firm of James E. Mitchell Company, Philadelphia, Pa., cotton yarn dealers, for twenty years, died at his home in Newbold, N. J., on the 18th of June, aged 74 years.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Yarn and Cloth Calculations for Cotton Fabrics; by Thomas Yates. 108 pages. Price $1.00.

The second edition of this handy little book has been issued. The first edition was used as a text book in the New Bedford Textile School and proved to be so convenient that the outside demand made it advisable to publish it for general circulation. The rules for different yarn and cloth calculations are given, the examples carefully worked out and explanations for the reasons of the rules. Besides these there are other rules useful in the weave room, such as figuring production and other necessary mechanical calculations. It may be obtained at this office.

Spinning and Weaving Calculations; by N. Reiser; D. Van Nostrand Co., New York. 160 pages. Price $5.00.

This book, which has already had several German editions, has now been translated into English. The work is well done and to the English reader the book will be of great usefulness. Unfortunately for the American reader, however, the calculations are in pounds, shillings and pence, which seriously detract from its value to this country. The scope of the work is exhaustive and takes up the subject of calculations in all branches of the woolen mill, including estimates of raw material, yarn calculations, reeds and reed setting, cost of weaving, warp contraction, estimating the cost per yard from small samples, finishing room calculations, etc.

Year Book for Colorists and Dyers; Herman A. Metz, New York City.

The seventh volume of the Year Book for Colorists and Dyers, compiled by Herman A. Metz of H. A. Metz & Co., 122 Hudson St., New York, is at hand and contains a comprehensive review of the novelties in dyestuffs, dyeing and chemical patents, new processes, machinery, etc., for 1904. The book is most systematically arranged, and no other publication that we know of presents in such concise form the history of this branch of the industry from year to year.

Part I contains a number of reference tables for chemists and dyers. Part II, theory of dyeing. Part III, patents for 1904, covering not only dyestuffs and processes, but machinery pertaining to this branch and miscellaneous patents. Part IV, notes on processes, colors, etc. Part V, educational: giving the processes of the schools teaching chemistry and dyeing and new books of the year pertaining to the subject. Part VI, dyes, makers and methods. Part VII, miscellaneous notes. The book is attractively printed and handsomely bound.

General Technical Lexicon (Lexikon der gesamten Technik); by Otto Lueger; 320 pages, 7 1/2 by 11; Deutsche Verlags-Anstalt, Stuttgart and Leipzig. Price of each part, $2.00.

We have received the first three instalments of this work which is to be issued in forty parts. It is in reality a technical encyclopedia, the subjects being treated in such detail as to remove the work from the list of lexicons. The text is in German and the work is apparently compiled with the usual care and thoroughness of German authors.

Business Literature.

New Process of Spinning; Standard Spinning Machine Co., Pittsburg, Pa.

A very attractive booklet which describes and illustrates in detail the new process of continuous spinning for carded wool or any other fibrous material. It is the invention of Frank A. Breeze, whose efforts for the last seventeen years to perfect a spinning frame along these lines has resulted in the practical machine which is now being built for the trade. A frame of 120 spindles is in operation at 46 Park Place, New York City. Every woolen manufacturer and woolen spinner will be interested in this booklet.

Philadelphia Textile School.

The annual catalogue and circular of this institution is now printed for the 29th season and contains all the information that any prospective student would wish to know including many views of the school showing its practical equipment. Not the least interesting feature is the partial list, which, however, is a long one, of former students of the school and their present occupations. This is the strongest possible evidence of the character of the men who have graduated from this institution, and can testify to its helpfulness.

New Bedford Textile School.

The bulletin issued by this institution is at hand and contains a calendar for the fall and spring terms with a list of studies and much general information for the prospective student. One department that is unique with this institution is a fully equipped knitting branch.

Mississippi Textile School, Agricultural College, Miss.

This institution sends out a comprehensive catalogue for its textile department giving a list of the faculty, history and purposes of the school, describing the different courses of instruction, equipment and other interesting information. Its course includes the different branches of cotton manufacture from the raw material to the finished fabric. There is also a comprehensive course in textile chemistry and dyeing.

Air Washers and Filters; New York Blower Co., Chicago, Ill.

A circular showing different devices by the wet and dry process and much valuable information on the subject of cleaning air for heating, ventilating, drying, etc. A copy will be mailed upon applicattion to any one interested.

Renold Roller Chain; The Link Belt Engineering Co., Philadelphia, Pa.

A pamphlet describing and illustrating the Renold roller chain. There are also notes on how to choose and lay out a chain gear and some valuable information on the care and lubrication of chain drives.

The Horseless Age, 15 Murray St., New York City.

The issue of this journal for July 5, 1905, is devoted to motor interests as applied to business purposes. The publishers have spent much time and money in securing illustrations and descriptions of the various types of automobiles used for trucking and delivery purposes in this country and abroad, and the result is a special issue which is well worth reading.

A B C Exhaust Fans; American Blower Co., Detroit, Mich.

A sixty-six-page catalogue, fully illustrated, describing the various types of exhaust fans made by the American Blower Co. Valuable information relative to setting up and piping exhaust fans is also given and numerous tables showing the speed, capacity, dimensions and price of the different styles. A copy will be mailed on application.

Mason Reducing Valves; The Mason Regulator Co., Boston, Mass.

This is a copyrighted catalogue of fifty-six pages in which are described and illustrated all the various styles of reducing valves made by The Mason Regulator Co. Full directions for applying each valve are given and there are also tabulated price lists of the different styles and sizes. A copy will be sent on application.

Fan and Blower Work.

The Green Fuel Economizer Co., Matteawan, N. Y., announce that they are now prepared to execute orders for steel blowers, fans, heaters, exhausters, etc., for all purposes. They have recently erected a new shop equipped with new tools and are prepared to undertake all sorts of installations where this work is required.

Change of Name.

The name of the Friedberger Manufacturing Co. has been changed to Friedberger-Aaron Manufacturing Co. The only changes are those in name, the business being conducted without interruption at 18th Street and Fisher's Lane, Germantown, post-office address Logan Station. This concern is widely known throughout the knit goods trade as manufacturers of everything in the way of braids, laces and edgings. Every manufacturer of ladies' ribbed underwear is, or ought to be, familiar with this standard line. Max N. Aaron, whose name now appears in the company's title, is vice-president, and has long been connected with the concern.

A beautiful memorial of the late Frederick John Warren, president of the Warren Bros. Co., has been issued, containing some of the many tributes paid to his memory by his business associates, and also a striking portrait of Mr. Warren. It will be a surprise when considering his business achievements to know that Mr. Warren had but just passed his thirty-ninth year. The business which he has established on such a firm foundation will be a monument to his ability.

Convenient for Towel Manufacturers.

The doupe cutter made by James A. Cameron, 4th Ave. and Baltic St., Brooklyn, N. Y., is likely to interest manufacturers of toweling. By its use, multiple width webs of toweling, woven together, may afterwards be cut apart exactly on the line desired, with great improvement over the hand method. Mr. Cameron's line of cloth cutting machinery opens up many possibilities which will occur to manufacturers.

The advantage of rapid circulation of air in the process of drying is always well exemplified by application of the blower or hot blast system. In a recent installation made by the B. F. Sturtevant Co., of Boston, Mass., for the Collings-Taylor Co., Cleveland, Ohio, a blower in connection with massed steam coils was arranged to discharge the heated air beneath beds for drying wet rags containing 33 1/3 per cent. of water. Under the system previously in use the beds were provided with direct steam piping beneath and with disc fans to draw the air over this scattered piping. With this system 2 1/2 to 3 hours were required to secure satisfactory results. By concentrating all of the heating surface and using a pressure fan to make positive and more generous circulation of the air, the time of drying was very materially reduced and the value of such rapid circulation was rendered evident.

The White Mountains.

BEAUTIFUL SCENERY AND WONDERFUL WORKS OF NATURE.

The White Mountains of New Hampshire are famous the country over as America's most beautiful summering section. The awe-inspiring and wonderful scenery; the magnificent grandeur of these "Crystal Hills"; the numerous handiworks of nature—interesting ravines; high mountain cliffs; wonderful, gorgeous, towering peaks; the marvelous profile in rock of the "Old Man" in Profile Notch and the figure of the White Horse of North Conway. There is something new to see every day in the mountains. The hotels range from the most palatial and sumptuous hostelries in the country to delightful boarding houses and cosy cottages and camps. Visit the mountains on your vacation! You will then realize the magnificence of New England scenery. A beautiful portfolio containing choice half-tone reproductions of the handsomest mountain scenes, entitled "Mountains of New England," will be mailed to any address by the General Passenger Department, Boston & Maine Railroad, Boston, upon receipt of six cents, and a descriptive book, profusely illustrated and containing a detailed description of the mountains, will be sent upon receipt of two cents in stamps; also a colored "Bird's Eye view of the Mountains as seen from the Summit of Mount Washington," will be sent upon receipt of six cents in stamps; or the whole for fourteen cents.

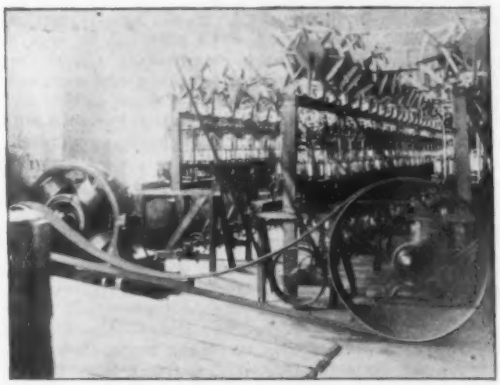
A Power and Worry Saver.

The following letter from Hanscom Bros., Fall River, Mass., is a striking endorsement of the value of Cling-Surface. When this preparation first came on the market several years ago, power users and many manufacturers were inclined to look upon it as one of the many belt dressings which appear from time to time and then are heard of no more. Cling-Surface has been on the market now long enough to demonstrate what it accomplishes and, what is still more important, it does not injure or rot the belt.

Hanscom Brothers,
Manufacturers of Braids and Tape.
Fall River, Mass., May 3, 1905.

Cling-Surface Mfg. Co., Boston Branch, 170 Summer St., Boston, Mass.:

Gentlemen: We are pleased to give you our experience with Cling-Surface. We have always known that a slack belt means money saved. To gain this end we used many dressings, but none of them would do the work for more than a few days without another application of the dressing.



A BELT TREATED WITH CLING-SURFACE.

We decided to run a tight belt rather than put an idler on the arc. Cling-Surface was brought to our attention, and we gave it a trial, with the result that we put a new main belt on, first giving it a thorough dressing on both sides with Cling-Surface. Result: We have the easiest running belt, least wear of counter, motor and hangers in this section. Our main belt is today in perfect condition. We have never had the least trouble with it. The same lacings still hold where we put them two years ago. Our other belts show the same perfect condition.

Our belt runs 1,200 feet per minute and is belted from a 25 h. p. motor, 6-inch pulley, to a counter 35-inch pulley. Distance between centers, 10 feet. The belt, which is a 6-inch double, takes the place of an 8-inch belt we took off, and does more work with less power than the old one. We will stand back of our statement.

We have had many men who were conversant with the advantages of easy running belts see our belts, and their opinion is that we have perfect running belts. We, therefore, after giving Cling-Surface two years' trial, and use, to our entire satisfaction, recommend it as a power, labor and worry saver.

(Signed) Hanscom Bros.

Contracts for Elevators.

The Marine Engine and Machine Co., manufacturers of electric elevators, have removed their offices to 126 Liberty St., New York, where they occupy the entire fourth floor. This company have recently secured the following contracts: The Hutchins Building, at southeast corner of 5th Ave. and 39th St., C. P. H. Gilbert, architect, Thompson-Starrett Co., builders, four of their direct connected electrically controlled elevators. The College of the City of New York, George B. Post, architect, Thomas Dwyer, builder, eleven electric elevators, one tandem electric elevator for building of the New Orleans Railways, Sanderson & Porter, engineers. One electric elevator in the Hartford Building, 17th St. and Union Sq., this city. Two electric elevators for the Pennsylvania Railroad Co., at Long Island City, Westinghouse, Church, Kerr & Co., engineers. One electric elevator for the Willett Realty Co.'s new building at West End Ave. and 82nd St., Carlton Strong, architect; and one automatically controlled residence lift for C. W. Luyster, at No. 16 East 67th St.

Artificial Cotton.

Some recent experiments have been made in Bavaria in regard to preparing artificial cotton from pine wood, and it is said that the new process allows it to be made cheaply enough so that the artificial cotton may compete with the natural product. In the method which has proved the most successful the wood, which has had the bark removed, is cut into thin sticks or fibres one-sixteenth of an inch or less in thickness. These are placed in a large horizontal copper cylinder lined with lead, into which steam is passed. When the separating action of the steam on the wood fibre has been prolonged sufficiently, an acid solution of sodium sulphite is added and the cylinder is heated under a pressure of three atmospheres during thirty-six hours. The wood, which has become completely white, is washed and then passed through a crusher. After washing again, the fibres are further whitened by a chloride of lime treatment. The matter which is thus obtained is dried and constitutes a pure cellulose which is then heated under pressure with a mixture of nitric and hydrochloric acids and chloride of zinc. The pasty mass thus formed is mixed with a little gelatine and castor oil, which give a certain resistance to the fibre. The cellulose is then formed into fine threads by a spinning machine, and these are washed in a carbonate of soda solution and dried. These threads are said to form a very good fabric when woven, and can easily be dyed. Although the experiments have as yet been carried on only in the laboratory, there is no doubt that the process may be applied on a large scale, thus coming into the European market as a competitor for the imported cotton.—Scientific American.

Is the Turbine Business Growing?

That the steam turbine is rapidly increasing its foothold in the power field is evidenced by the remarkable increase in manufacture of the well known Westinghouse-Parsons type. During the six months ending June 30th, 1905, The Westinghouse Machine Company, exclusive builders of the Westinghouse-Parsons type, have contracted for no less than 82,000 kilowatts in turbo-generating machinery, averaging nearly 1,175 kw. capacity per turbine unit. These machines range in size from 200 kw. to 7,500 kw. The latter will be the largest turbines in the world, and three units of this size are under contract for Greater New York railway and lighting power stations. In the distribution of these machines among the various industries, the electric railway has claimed the largest number of machines, averaging 1,496 kw. in capacity; next in order, industrial plants, averaging 571 kw. capacity, and light and power plants, averaging 1,529 kw. capacity. In the order of total capacity, railway plants have required 38,900 kw., lighting plants 26,300, industrial 12,000, miscellaneous 4,800.

This list bears excellent witness to the increasing possibilities of the turbine, and presages a brilliant future. The equipments noted represent solely actual sales only and not including contemplated business or partially closed contracts.

Textile Education by Correspondence.

Education by correspondence, although of recent origin, has long since passed its experimental stage and established itself as one of the greatest educational factors of the 20th century. The phenomenal growth of the International Correspondence Schools from their establishment in 1891 to the present time, when they employ 360 expert principals, assistant principals and instructors in the instruction department alone, and number 750,000 students and graduates, has been due to two facts, namely, that there was a large and untried field for correspondence instruction, and that they have covered this field so thoroughly and efficiently. They have recently published "1,001 Stories of Success" which gives the typical experiences of only a small proportion of their students and yet shows strikingly the increased efficiency and earning power of those who have taken their courses of instruction. This publication, together with full information concerning their textile courses, will be mailed free upon application to C. P. Brooks, principal and manager of The Textile Department of the International Correspondence Schools, Box 836, New Bedford, Mass.

The American Card Clothing Company have taken over the card clothing business of James Smith & Co., of Philadelphia, and have removed to their new quarters at American and Dauphin Streets, Philadelphia, where they have a large plant. B. V. Hevener, who has been connected with this branch of James Smith & Co.'s business for the last sixteen years, will have charge of the Philadelphia office.

The Los Angeles (Cal.) office of the Westinghouse Electric & Mfg. Company, which has heretofore been in the Trust Building, has been removed to 527 South Main Street.

The matter of satisfactory lubrication is probably the most vexatious problem which comes before the general user of machinery. Those who have tested Albany grease, made only by Adam Cook's Sons, 313 West St., New York City, find it offers a solution of difficulties along this line. The manager of a large laundry plant in Chicago writes: "The grease works very satisfactorily and we shall use it hereafter in preference to what we have had."

Size Blender.

The Arabol Size Blender and the International Prize Starch, the latter an improvement on the old-fashioned potato starch, which were brought out by the Arabol Mfg. Co., 100 William St., New York, last year, have been in use long enough now to warrant a fair judgment. Mill men who have tried them find them very satisfactory and have given large contract orders.

The annual report of the Commissioner of Patents for 1904 shows that the Draper Company stand second in the number of patents issued or assigned to them. They have 128, being surpassed only by one other concern, the General Electric Company.

The staff of the Gainesville Cotton Mill, Gainesville, Ga., is comprised as follows: superintendent, M. G. Stone; assistant superintendent, J. S. Collier: comber, J. A. Sorrells; spinner, J. C. Edwards; weaver, W. S. Smith; chief engineer, J. M. Stewart.

The Good Old Summer Time.

When and where to go for a vacation is a question which perplexes us all. There are beautiful places in every section of the country, but to reach them at a moderate rate and within a reasonable time is a great barrier.

New Jersey has bounded to the front as a summer resort and well she might, since her shore is within reach of all. Her attractions are too numerous to mention, and the accommodations provided for the tourist being unequaled anywhere in the land. The famous beach resorts of New Jersey are Atlantic Highlands, Seabright, Long Branch, Asbury Park, Ocean Grove, Belmar, Spring Lake, Sea Girt, Point Pleasant, Atlantic City, Ocean City, Cape May and Beach Haven. Each is unique in environments and caters to the best class of Summer travelers. Every convenience is at hand for genuine enjoyment and each can be reached by rail or boat, the lines are both operated by the New Jersey Central and C. M. Burt, G. P. A., 143 Liberty St., New York, has issued an illustrated brochure detailing the beauties and advantages of the above resorts and a hundred others. This book will be sent to any address upon receipt of six cents in stamps, and one looking for a vacation region would do well to send for it.

New Dining Service on the New Jersey Central.

The New Jersey Central has just placed in commission on its New York and Philadelphia line six new dining cars. They leave New York and Philadelphia simultaneously at 7 and 8 a.m. 12 noon and 1, 5 and 6 p.m. The service is superb and every detail is arranged to meet the exacting requirements of the traveling public, each car has dining as well as cafe compartments, the furniture is of mahogany and leather and the interior furnishings are not only elaborate but comfortable. The commissary department is directed by a steward of wide experience and the management of the New Jersey Central intend that its dining car service shall be as famous as its hourly train service between New York and Philadelphia.

Wide-Awake Concerns.

In the July number of the Textile World Record the Butterick Trio published in their advertisement the names of seventy-one concerns manufacturing textile goods that had used space with them during the last twelve months. As a matter of curiosity we looked up this list and found that with a few exceptions, mostly jobbing houses, all these concerns were subscribers of the Textile World Record. It is more than a coincidence that manufacturers who are wide-awake and up-to-date in their methods are usually subscribers to one or more of the trade publications in their line. The manufacturer who has not time to read or who knows it all and has no use for his trade paper is usually one of the old fogy kind whose mill needs reorganizing, or else he has too small a plant to attempt to do a competitive business.

Any attempt to keep a dye house or paper mill clear of steam emphasizes the truth of the old saying that "an ounce of prevention is worth a pound of cure." With proper equipment it is a simple matter to prevent the formation of steam and the deposit of moisture, but even with an elaborate system it is almost impossible to remove the steam when once it is made visible. Two elements are essential to a completely successful system. First, the supply of an ample quantity of warm, dry air, and second, the local removal of the saturated air as it leaves the cylinders and before it is cooled so as to show itself as steam.

The B. F. Sturtevant Co., of Boston, Mass., has made a special study of the conditions which have borne fruit in many successful installations. In the majority of cases fresh air from out of doors is drawn through a heater by means of a fan, and forced through a system of piping into the particular room or rooms in which the trouble from steam exists. From this system the air is thoroughly distributed throughout the room, with the result that a constantly changing volume of dry and warm air is maintained. The cooling action of the roof is overcome, the moisture is greedily absorbed and dripping is absolutely prevented. In the most complete systems hoods are provided over machines or vats and connected with exhaust fans so as to remove at once the cause of the trouble and render the circulation of air still more positive.

The Saco and Pettee Machine Shops are now installing in the Monadnock Mills, Claremont, N. H., revolving flat cards, railway heads and drawing frames.

Contracts for complete heating and ventilating systems have recently been taken by the B. F. Sturtevant Co., of Boston, Mass., for the Fall River Iron Works Co., Fall River, Mass.; Nashua Mfg. Co., Nashua, N. H.; Bemis Bros. Bag Co., Kansas City, Mo.; Fore River Shipbuilding Co., Fore River, Mass.; Lewis A. Crossett, North Abington, Mass.; and Trenton Brass & Machine Co., Trenton, N. J.

Lake Winnepesaukee.

NUMEROUS ISLANDS FOR COTTAGERS AND CAMPERS.

Lake Winnepesaukee, one of the most beautiful lakes in the country is situated at an elevation of 472 feet above sea level. Its ideal location between the Pemigewasset and the Merrimack Valleys at the foot hills of the White Mountains has made it a very desirable summering section. Weirs, Alton Bay, Wolfeboro, Centre Harbor and other choice spots are delightful summer havens. A large and palatial steamer, the Mount Washington, sails over the lake covering a course of sixty miles and stopping at the principal ports. The surface of the lake is dotted with innumerable islands, which serve as charming summer grounds for cottagers and campers. The scenic surroundings of Lake Winnepesaukee are beautiful beyond description. In the distance the high peak of Mount Washington can be observed, while nearer, the summits of Belknap and Passaconaway are visible.

No better region in New Hampshire can be selected for a summer vacation. Send six cents in stamps to the General Passsenger Department, Boston & Maine Railroad, Boston, for the beautiful colored map of Lake Winnepesaukee, showing the numerous islands, glens and coves. A two-cent stamp will bring you a delightful illustrated and interesting descriptive booklet entitle "Lakes and Streams of New England," which gives a detailed description of New Hampshire's chosen lake.

Resorts and Tours, Illustrated, 1905. A Vacation Directory and Encyclopaedia Free.

"Resorts and Tours, illustrated" for 1905 is really a vacation directory and encyclopaedia for the traveler. It contains 90 pages of delightful descriptive reading, beautiful half-tone illustrations and a list of about 1,500 resorts; also complete information regarding rates, hotels, railroad routes, etc. Send a postal card to the General Passenger Department, Boston & Maine Railroad, Boston, requesting one and we'll mail it free.

Recent Textile Patents.

DYEING MACHINE. 794,560. Robert P. Smith, Philadelphia, Pa., assignor of one-half to George E. Drum, Philadelphia, Pa.

DYEING MACHINE. 793,488. James A. Willard, Chattanooga, Tenn., assignor to Vacuum Dyeing Machine Co., Chattanooga, Tenn.

FABRIC AND ORNAMENTING Same. 794,045. William J. Pope and Julius Hubner, Manchester, England.

INDIGO VAT, Hydrosulfite. 794,050. Paul Sellert, Ludwigshafen, Germany, assignor to The Badische Anilin und Soda Fabrik.

INDIGO WHITE, Making. Paul Seidel and Robert Wimmer, Ludwigshafen, Germany, assignors to The Badische Anilin und Soda Fabrik.

LOOMS and the Appliances Used Therein. Production of Heddles for Use in. 794,590. Thomas E. Dean, Tyldesley, England.

LOOM ATTENDANCE, Apparatus for Facilitating. 794,701. Fernando G. Cobb, Huntsville, Ala., assignor to Draper Co., Hopedale, Mass.

LOOM, CIRCULAR. 795,228. Albert De Laski, Hoboken, N. J.

LOOM FILLING Tension Device. 794,685. A. L. Scarboro, Charlotte, N. C., assignor to Draper Co., Hopedale, Mass.

LOOM, HAIRCLOTH. 795,249. George S. Cox, Fitzwatertown, Pa., assignor to George S. Cox & Bro.

LOOM HEAD Motion. 795,251. George S. Cox, Fitzwatertown, Pa., assignor to George S. Cox & Bro.

LOOM PICKER STAFF and Sweep Stick Connection. 793,182. Eugene Crinon, Vassalboro, Me.

LOOM SHUTTLE. 793,581. James A. Hartmann, Salisbury, N. C.

LOOM SHUTTLE. 793,359. Sumner A. Dudley, Taunton, Mass.

LOOM SHUTTLE CHANGING Mechanism. 793,278. Oscar Cosserat, Amiens, France.

LOOM SHUTTLE and Filling Carrier. 793,621. Omar Benson, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM STOPPING Means. 793,964. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS, Thin Place Detector for. 794,966. Junious H. Bagwell, West Durham, N. C., assignor to Draper Co., Hopedale, Mass.

LOOM WARP STOP Motion. 794,922. Napoleon Boivert, Lawrence, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP STOP Motion Mechanism. 794,917. Arthur E. Benson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WEFT Replenishing Mechanism. 794,377. Felix O'Donnell, Pawtucket, R. I., assignor of one-half to Susan A. Brown, Pawtucket, R. I.

LOOM CENTER SELVAGE Mechanism or Attachment. 788,918. Hector Ledoux, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM LAY Narrow Ware. 790,235. William Wattie, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM SHUTTLE BOX. 789,443. Albert D. Moore, South Hadley Falls, Mass.

LOOM STOPPING Means. 789,283. Onesime Landry, Lawrence, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM TAKE-UP Mechanism. 789,168. Charles J. Nauen, Paterson, N. J.

LOOM SHUTTLE. 12,371. Charles B. Webster, Fall River, Mass., assignor of one-half to James K. Lanning, Boston, Mass.

This invention relates to shuttles for looms and its object is to provide a self-threading shuttle of simple and cheap construction which will not become accidentally unthreaded.

In the accompanying drawings, Fig. 1 is a side elevation of one end of the shuttle. Fig. 2 is a top plan view of the same.

In the solid end portion of the shuttle, 1, is cut a longitudinal slot or recess, 2, extending down

Fig. 1

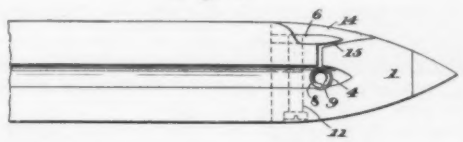
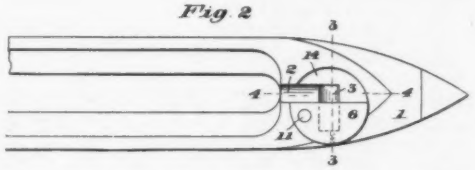


Fig. 2



from the top of the shuttle to about its centre. This slot opens at its rear end into the hollow body of the shuttle. At its front end is a lateral recess, 3, somewhat deeper than the slot, 2, and extending nearly to the outside of the shuttle. Near its lower end is a circular hole, 4, in the side of the shuttle, and a narrow thread-entering slit runs from the top of the shuttle down to the top of the hole, 4.

After entering the thread-guide the thread is prevented from re-entering the thread-inlet passage, 9, and from any tendency to unthread by the beveling or recessing of the outer face of the thread-guide at the point where the inlet-passage enters, thereby causing the shuttle-walls to project relatively beyond the mouth of the passage.

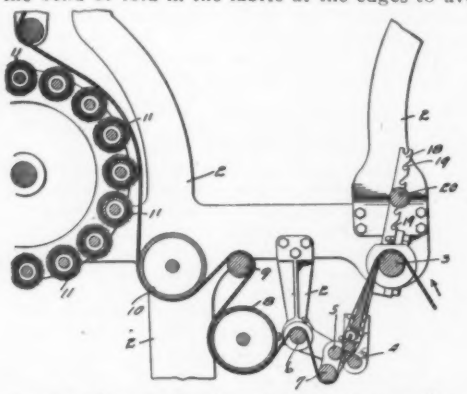
LOOM WEFT Replenishing Mechanism. 12,370 (Reissue). Edward D. Thayer, Worcester, Mass., assignor to Crompton-Thayer Loom Co., Worcester, Mass.

LOOM WEFT Positioning Means. George S. Cox, Fitzwatertown, Pa., assignor to George S. Cox & Bro.

LOOM WEFT Replenishing. 793,337. Horace Wyman, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

NAPPING MACHINES, Attachment for. 790,722. Frank Chatfield and James Struthers, Minneapolis, Minn.

This invention relates to devices adapted for use in connection with a machine for fleecing or napping a tubular fabric, such as is used in the manufacture of fleece-lined garments. The object of the invention is to provide means for changing the bend or fold in the fabric at the edges to avoid



over-napping or fleecing at that point as the material passes through the machine. It consists generally in a mechanism or device for moving the fabric laterally to present a new surface at the point where the bend or fold is made at the edges of the flattened tube. The accompanying drawing is a sectional view of a portion of a napping machine with this invention applied thereto.

SIZE, MANUFACTURING. 793,600. Walter Moeller-Holtkamp, Muenchen-Gladbach, Germany.

SPINDLE BOBBIN CLUTCH, Rotatable. 794,694. William E. Allen, Salem, Mass., assignor to Sawyer Spindle Co., Portland, Me.

SPINDLE BOBBIN DRIVING MEANS, Rotatable. 794,693. Frank H. Thompson, Hopedale, Mass., assignor to Sawyer Spindle Co., Portland, Me.

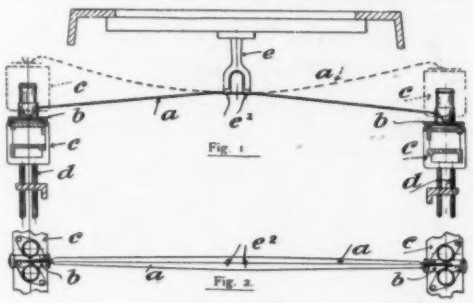
SPINNING BOBBINS, Apparatus for Making. 794,543. Ira F. Peck, Auburn, and Charles Hird, Woonsocket, R. I.

SPINNING FRAME. 793,694. Richard Todd, Heaton Chapel, and J. A. Stott and A. H. Stott of Manchester. England.

This invention relates to the spinning of yarns upon the bare spindle of the ordinary diameter in frames principally of the throstle type.

It is found in practice that a quick drop during the first instant of time after the top of the chase is reached is of the greatest importance in building good cops, and that the action of gravity in dropping or pulling down the rails is not sufficiently quick in overcoming the inertia of the parts. To overcome this and obtain the instant quick drop the inventors propose to use springs which are compressed or extended, and on release of the rails cause instantaneous descent so far as the desired quick drop is concerned.

Fig. 1 is a sectional elevation of so much of a



throstle-frame as will locate the parts and show one form of spring fashioned and mounted so as to have the desired effect on the rails. Fig. 2, which is a plan view, shows one spring in connection with the rising and falling rails.

SPINNING OR TWISTING Apparatus, Ring. 794,700. William T. Carroll, Worcester, Mass., assignor to Draper Co., Hopedale, Mass.

SPINDLE. 791,169. Morris Subber, Woodbine, N. J.

SPINDLE. 791,436. Arthur S. Browne, Washington, D. C., assignor to Sawyer Spindle Co., Portland, Me.

SPINDLE FORGING MACHINE. 791,204. Henry T. Owen and Chas. T. Burlin, Whitinsville, Mass., assignors to the Whitin Machine Works, Whitinsville, Mass.

SPINNING MACHINE Thread Guide Attachment. 791,259. George A. Fredenburgh, Pawtucket, R. I.

SPINNING MACHINE Yarn Controller. 791,361. John O'Sullivan, Taunton, Mass.

SPINNING AND TWISTING RING. 791,615. Theodore P. Farmer, Southwest Harbor, Me.

SHUTTLE BOX MOTION. 790,903. George W. Kuenneth, New York City.

THREAD DRESSING MACHINE. 791,686. George A. Fredenburgh, Pawtucket, R. I.

TWISTING AND SPINNING Machine. 794,866. Achille Klein, Roubaix, France.

WARP CREEL. 791,722. Isaac E. Palmer, Middletown, Conn.

WARP THREAD Drawing-In Machine. 791,768. Ulrich Ganz and Albert W. Francois, Wilmington, Del.

WINDING MACHINE LUMP or Slub Catcher, Yarn. 793,084. William S. Mills, Bridgeport, Conn., assignor to D. P. Mills, Naugatuck, Conn.

WOVEN FABRIC. 793,524. Harry D. Hewett, Providence, R. I., assignor to United Silk Mfg. Co., Providence, R. I.

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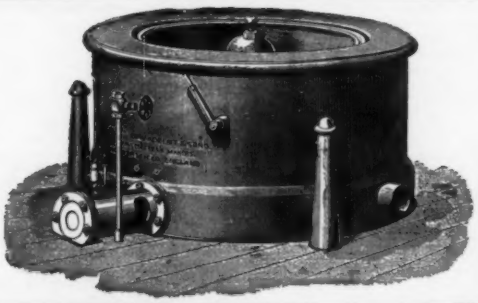

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HANSCOM BROTHERS,

MANUFACTURERS OF

BRAIDS AND TAPE.

FALL RIVER, MASS., May 3d, 1905.

Cling-Surface Co.,
Boston Branch, 170 Summer Street, Boston, Mass.

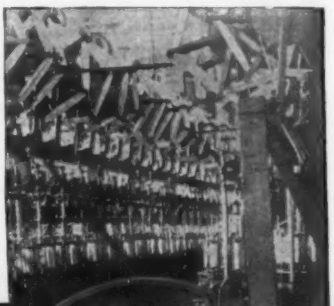
Gentlemen: We are pleased to give you our experience with Cling-Surface. We have always known that a slack belt means money saved. To gain this end we used many dressings, but none of them would do the work for more than a few days without another application of the dressing. We decided to run a tight belt rather than put an idler on the arc. Cling-Surface was brought to our attention and we gave it a trial, with the result that we put a new main belt on, first giving it a thorough treatment on both sides with Cling-Surface. Result: we have the easiest running belt; least wear of counter, motor and hangers in this section. Our main belt is today in perfect condition. We have never had the least trouble with it. The same lacings still hold where we put them two years ago. Our other belts show the same perfect condition.

Our belt (shown in picture) runs 1200 feet per minute and is belted from a 25 h. p. motor, 6-inch pulley, to a counter 35-inch pulley. Distance between centers, 10 feet. The belt, which is a 6-inch double, takes the place of an 8-inch belt we took off, and does more work, with less power, than the old one. We will stand back of our statement.

We have had many men who were conversant with the advantages of easy running belts, see our belts, and their opinion is that we have perfect running belts. We, therefore, after giving Cling-Surface two years' trial, and use, to our entire satisfaction, recommend it as a power, labor and worry saver.

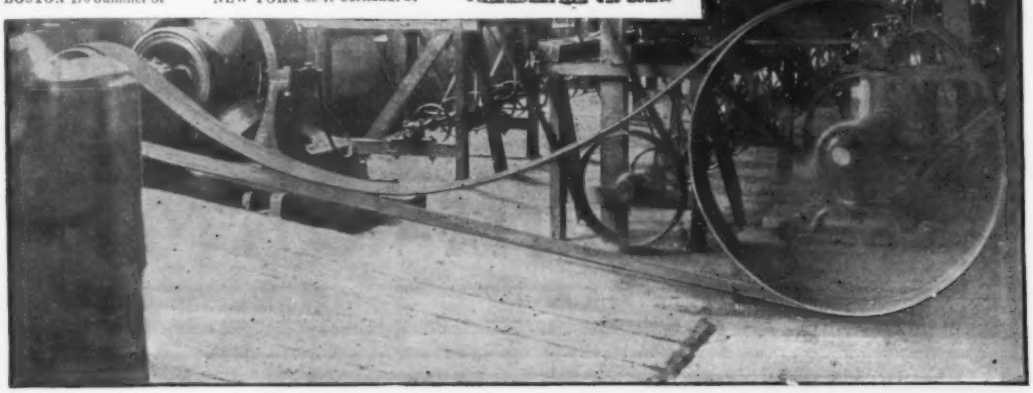
HANSCOM BROS.

Send for a trial package of Cling-Surface.



CLING-SURFACE CO 198-205 Virginia Street Buffalo N Y

BOSTON 170 Summer St NEW YORK 39-41 Cortlandt St PHILADELPHIA The Bourse



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NO BOILER SAFE WITHOUT THEM.

Will positively sound an alarm when water in boiler reaches the low or high danger limit.

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2 T W R

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accountants, Public.
Cathrall, W. M.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.
Schutte & Koerting Co.

Architects and Mill Engineers.
Ballinger & Perrott.
Dean & Main.
Ferguson, John W.
Suck, Adolph.

Auditors.
Cathrall, W. M.

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North Chemsford Machine Co.
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Bandings.
——See under Yarns.

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Belting.
Main Belting Co.
Shultz Belting Co.
Turner, J. S., Mfg. Co.
——See also Mill Supplies.

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Stephenson Mfg. Co.

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Birdsboro Steel Foundry & Machine Co.

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McLeod & Henry.

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——See Steam Boilers.

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Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass (Perforated).
——See under Perforated Metal.

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Ferrofix Brazing Co.

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——See Napping Machines.

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Philadelphia Drying Machinery Co.
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Bowes, L. M., Co.
Leigh, Evan A.
Riley, C. E. & Co.
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Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
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Pettes & Randall Co.

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Chaffee Bros.
Pearson, J. T.
Shryock, J. K.
Smyth, J. L. N. Paper Co.

Cloth Cutting Machinery.
——See Cutting Machinery.
Cameron, James A.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
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Humphrey Machine Co.
Hunter, James, Machine Co.
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Reeves Pulley Co.

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Baker Machine Corporation.

Combs (Wool and Cotton).
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Leigh, Evan A.
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Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

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Schutte & Koerting Co.

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Dodge Coal Storage Co., United Telpherage Dept.
Link Belt Engineering Co.

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Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

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American Textile Specialty Mch'y Co.
American Drying Machinery Co.
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Baker Machine Co.
Barber & Coleman Co.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.
Coldwell-Gildard Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
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Firth, William, Co.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.

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Philadelphia Textile Machinery Co.
Providence Machine Co.
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Saco & Pettee Machine Shops.
Schofield, Geo. L.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

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Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

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Bosson & Lane.
Warren Soap Mfg. Co.

Cotton Waste.
Blaisdell, S., Jr., Co.
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Dixon, Jos., Crucible Co.
Lowell Crayon Co.

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Eastman Machine Co.

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Crompton-Thayer Loom Co.
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Metallic Drawing Roll Co., The.

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Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
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Philadelphia Textile Machinery Co.
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Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
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Vacuum Process Co.

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Philadelphia Drying Machinery Co.

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Cranston Worsted Mills (Yarns).
Davidson, J. F.
Fawell, Arthur.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Providence Mills Mfg. Co.
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Western Textile Fibre Co.

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Allen, William, Sons Co.
American Blower Co.
American Drying Machinery Co.
American Dyeing Machine Co.
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Birch, Arthur, Arlington Mch. Wks.
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Curtis & Marble Machine Co.
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Heusch, Severin.
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Smith, Drum & Co.
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Vacuum Dyeing Machine Co.
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Dye Sticks.
Bailey, Frank.
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American Chemical Co.
American Dyewood Co.
Atteaux, F. E. & Co.
Barrett Mfg. Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Kalle & Co.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Johnson, Chas. A. & Co.
Klipstein, A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Nicol, J. M. & J. S.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F. & Co.
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Vila, H. S.
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Electrical Construction.
Crocker, Wheeler & Co.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
Crocker, Wheeler & Co.
General Electric Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Crocker, Wheeler & Co.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Salem Elevator Works.

Embroidery Machines for Hosiery and Knit Goods.
Walther, Otto.

Employees' Time Recorders.
Pettes & Randall Co.

Engravers.
Smith Bros.

Exhaust Heads.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
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Fans.
Green Fuel Economizer Co.
Sturtevant, B. F., Co.

Feed Water Heaters.
Green Fuel Economizer Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
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Felt Hardeners.
Farrell Foundry and Machine Co.

Felting Machinery.
Farrell Foundry and Machine Co.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B. & Sons.

Finishing Machinery.
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Fire Box Blocks.
McLeod & Henry Co.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Badger, E. B. & Sons Co.

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Flax, Tow, Hemp and Jute Machinery.
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Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

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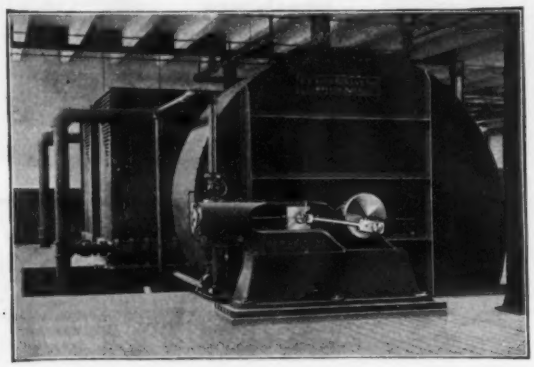
Planning and Installing a Satisfactory Blower Heating System

Planning and Installing a Satisfactory Blower Heating System isn't a thing to be done in a day. If you need to equip your plant for next winter you ought to consider it now. Frankly, we want to figure on it, and we want time to give it the consideration it deserves.



The Sturtevant System ventilates as well as heats, eliminates all scattered steam piping, utilizes exhaust steam, forces the air just where it is wanted and is under perfect control.

B. F. Sturtevant Co., Boston, Mass.

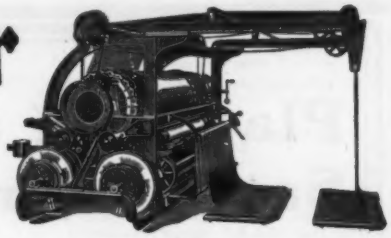
General Office and Works, Hyde Park, Mass.

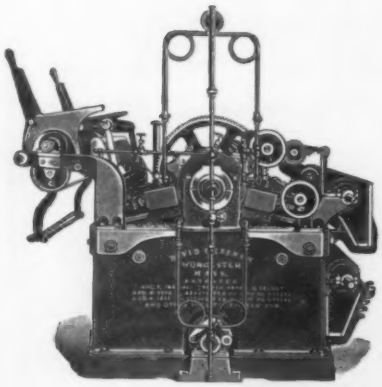
New York Philadelphia Chicago London

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fans, Blowers and Exhausters; Steam Engines, Electric Motors and Generating Sets; Fuel Economizers; Forges, Exhaust Heads, Steam Traps, Etc. 453

David Gessner

Worcester, Mass.

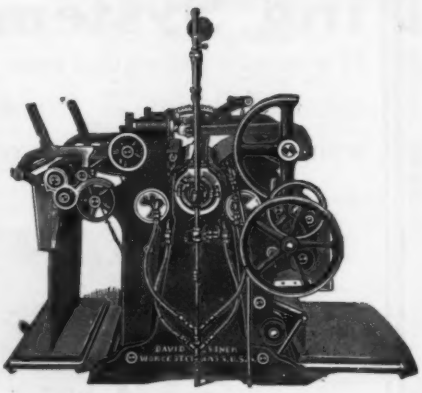




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Garnetts.
Garnett, P. & C., Ltd.
Leigh, Evan A.
Philadelphia Textile Machinery Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Walworth Manufacturing Co.

Gears.
Farrell Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrell Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W. & Co.

Grease.
Cook's, Adam, Son.

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Mitchell-Bissell & Co.

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Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

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Yale & Towne Mfg. Co.

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Hosiery Labels.
Beck, Charles Paper Co.
Kaumagraph Company.

Humidifying Apparatus.
American Moistening Co.
Bell Pure Air & Cooling Co.
Shutte & Koerting Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Riley, C. E. & Co.
Rodney Hunt Machine Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Injectors.
Lunkenheimer Co.
Schutte & Koerting Co.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Iron Work.
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Jacquards.
Halton's, Thomas, Sons.

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Cheney Bros.
Friedberger-Aaron Mfg. Co.
Hepner & Horwitz.
International Button Co.
Krout & Fite Mfg. Co.
Weimar Bros.

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Eastman Machine Co.
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Merrow Machine Co., The.
Nye & Tredick Co.
Rodney Hunt Machine Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Hilscher, G.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Koch, Edward W.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Ruth Machine Co.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

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Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
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Grosser Knitting Machine Co.
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Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

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THE NEW
CROMPTON-THAYER LOOM COMPANY
MANUFACTURERS OF
FANCY LOOMS
For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.
DOBBIES, BOX MOTIONS AND SUPPLIES.
Works and Offices: 677 Cambridge Street, Worcester, Mass.
Alexander & Garsed, Southern Agents.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Sawyer-Mann Electric Co.
Westinghouse Electric & Mfg. Co.

Lathes.
McCabe, J. J.

Leather.
Bowes, L. M., Co.

Loom Pickers.
Garland Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
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Lowell Machine Shop.
Mason Machine Works.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Lug Straps.
Kelley, W. H., & Co.
Bond, Chas.

Lumpers.
Gerry, George & Son.
Schofield, Wm., Co.

Machinery Dealers.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur.
Taylor, James.

Machinists' Tools.
Curtis & Marble Machine Co.
McCabe, J. J.
Whitin, The D. E. Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Murray Iron Works Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Suck, Adolph.

Mercerizers.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William & Sons, Ltd.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B. & Sons Co.

Mill Architects.
—See Architects and Mill Engineers.

Mill Brushes.
—See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
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Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Bond, Chas.
Buckley's, Benj., Son, Gun Mill.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Jefferson, Ed. & Bro.
Lane, W. T. & Bro.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W. & Co.
Philadelphia Drying Machinery Co.
Riley, C. E. & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G. & Son.
Tucker, W. W. & C. F.
Turner, J. S., Mfg. Co.
United States Supply Co.
Werd & Vandegrift.
Walworth Manufacturing Co.

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Curtis & Marble Machine Co.
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Jones, Lewis.
Leigh, Evan A.
Parks & Woolsen Machinery Co.
Whiteley, William & Sons, Ltd.

Noils (Silk).
Malcolm Mills Co.
Ryle, Wm. & Co.

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Here's a Photograph

of a Shultz Sable Rawhide Belt, 26 inches wide, three-ply, after running for 26 years in the plant of Keller & Tamm Mfg. Co., of St. Louis. It has now been cut up into narrower belts and another "Sable" is in its place. Sable Rawhide Belts are the cheapest belts made, because of their longer life and greater pulling power. Booklet No. 6 tells an interesting story.

SHULTZ BELTING COMPANY,
ST. LOUIS, MO.
New York, 111 Chambers St. Boston, 114 High St.
Philadelphia, 115 North Third St.

The Cotton Manual

BY J. T. BROADBENT

of the Bradford-Durfee Textile School, Fall River, and formerly of the Mississippi Textile School.

This little Manual was prepared with the idea of telling briefly, but comprehensively, the things about the cotton fibre, its cultivation, and the ginning and marketing of the cotton crop, the different kinds of cotton, and other matters bearing on raw cotton, such as the average student or person connected with cotton manufacturing or the sale of cotton goods, wants to know.

There are excellent chapters on cotton baling, describing the different kinds of bales and baling processes, and on the opening and mixing of cotton in the mill, with account of different machines employed, and improved methods of mixing.

The book contains about 100 pages, with 20 illustrations, and should be in the possession of every person having to do with cotton in any state, from the seed to the retail purchaser.

Price 75 Cents

Published by LORD & NAGLE COMPANY

299 DEVONSHIRE STREET, ... BOSTON, MASS.

Office Supplies.
Niagara Clip Co.

Oil Cups.
Lunkenheimer Co.
Tucker, W. & C. F.
Walworth Manufacturing Co.

Oils.
Borne, Scrymser Co.
Cook's, Adam, Son.
Excelsior Wool Compound Co.
Murphy, E. W. & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oil Hole Covers.
Tucker, W. W. & C. F.

Overhead Tracks.
Coburn Trolley Track Co.
Cohoes Foundry & Machine Co.

Overseaming Machines.
American Overedging & Seaming Machine Co.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Pantagraphs for Mill Engraving.
Johnson, C. A. & Co.

Paper.
Richardson Bros.
Smyth, J. L. N. Paper Co.

Paper Boards.
Shryock, J. K.
Smyth, J. L. N. Paper Co.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.
Langston, Samuel M.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.

Perforated Metals.
Beckley, A. J. Co.
Hopkins Machine Works.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B. & Co.
Walworth Manufacturing Co.

Pneumatic Conveying.
—See Ventilating.

Porcelain Guides.
Mitchell-Bissell & Co.

Power Transmission Machinery.
American Drying Machinery Co.
American Mfg. Co.
American Pulley Co.
Carlyle-Johnson Machine Co.
Cohoes Foundry & Machine Co.
Evans, G. Frank.
Farrell Foundry and Machine Co.
Hunter, Jas., Machine Co.
Kilburn, Lincoln & Co.
Klein, Chas. C.
Link Belt Engineering Co.
Philadelphia Drying Machinery Co.
Plymouth Cordage Co.
Reeves Pulley Co.
Rodney Hunt Machine Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
Sellers, William & Co.
Standard Pressed Steel Co.
Textile Finishing Machinery Co.

Preparatory Machinery (Cotton).
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Miller Press & Machine Co.
Murray Iron Works.
North Chelmsford Machine Co.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

Pressers and Flyers.
Baker Machine Co.

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Pulleys.
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Pulley Covering.
Warren Company, The.

Pumps.
Goulds Mfg. Co.
Humphrey Machine Co.
Knowles Steam Pump Works.
Rodney Hunt Machine Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

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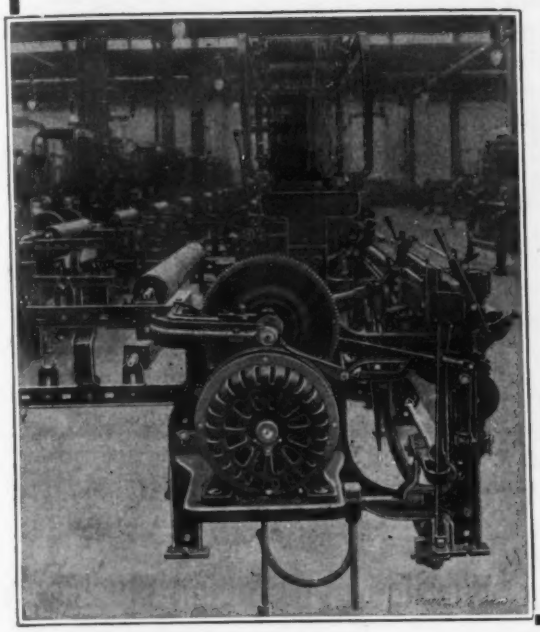

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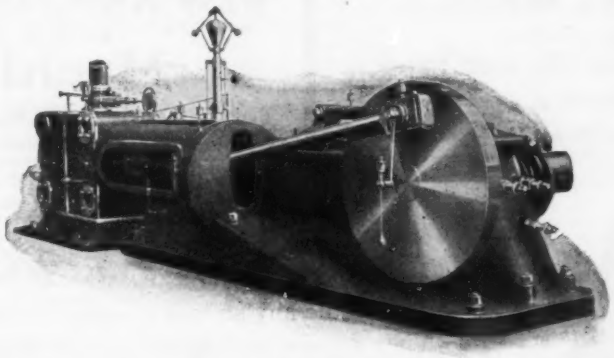

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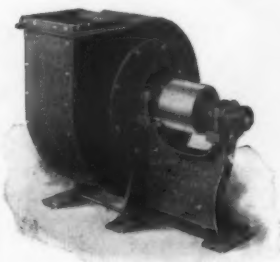

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Manager and Salesman Wanted for a first-class equipped woolen mill; a good chance for the right man to get an interest in the business. Write Geo. O. Shickler, Room 909, Arrott Bldg., Pittsburg, Pa.

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Designer. Young man, age 26, ten years' experience, worked on all kinds of cotton and silk dress goods on Jacquard and dobby, shirtings, upholstery, tie goods. Good at dissecting and reproducing samples, as well as producing new weaves and designs. Will go anywhere. Would help in office work if not sufficient work for a designer. Address Box 1304, Paterson, N. J.

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On Narrow Fabrics and Elastic Webs wants position. Address "Designer," care Textile World Record, Philadelphia, Pa.

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The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attention to this department. He would be pleased to hear from any of his friends who may be interested.

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Assistant Superintendent, or a good overseer's position. Worked on all kinds of filling warp, colored hosiery, mercerized thread, twist and ply yarns. Taken a course in designing, combing and weaving in textile school. Age 35, married. First-class references. 1957, Textile World Record.

Cotton Superintendent, worked on all kinds of sheetings, sateens; all kinds of fancies, lenos and lappets, Jacquard, cotton and silk mixed. Age 35, first-class references. 1934, Textile World Record.

Cotton Superintendent or overseer of carding. Worked on all white goods yarns from 12s to 150s. Familiar with the Lowell, Saco & Pettee revolving flat cards. Age 37, married; first-class references. 1898, Textile World Record.

Cotton Superintendent of a yarn mill. Familiar with all kinds of yarns, from 20s to 120s. Used to all kinds of American and English machinery. Age 39, married; first-class references. 1364, Textile World Record.

Cotton Superintendent, or superintendent and designer. Worked on all kinds of cotton, from 20s to 150s. Also large experience on lenos and other fancy goods. Some knowledge of Jacquards. All kinds of cotton machinery. Age 39, married. 2080, Textile World Record.

Cotton Superintendent. Yarn or weaving mill. Worked on all kinds of yarn, from 10s to 170s. Also all kinds of plain cotton goods. Age 37, married. 1027, Textile World Record.

Cotton Superintendent. Worked on dress goods, shirtings, skirtings, ginghams, cotton flannels and blankets. Familiar with all kinds of cotton machinery. Age 37, married; first-class references. 1432, Textile World Record.

Cotton Superintendent, now employed, but wishes to change. Worked on all classes of fancy lawns, sateens, twills, drills, denims, tickings, awnings, ducks, chambray and fancy dress goods. Familiar with all kinds of machinery. Age 38, married. 1226, Textile World Record.

Cotton Superintendent of a yarn or cloth mill, carder or spinner. Worked on all classes of goods, prints, sheetings, shirtings, fine dress goods, ginghams; also yarns and twines of all kinds. Age 39; first-class references. 1236, Textile World Record.

Cotton Superintendent. Now employed as boss weaver. Wishes to change to better conditions. Has had charge in some of the leadings mills in the United States. Age 44, married; first-class references. 335, Textile World Record.

Cotton Superintendent. Has been boss carder, ring spinner and comber on all kinds of cotton yarns, hosiery yarn a specialty. First-class references. Age 44, married. 3025, Textile World Record.

Cotton Superintendent or assistant superintendent. Worked on linen and union towels and crashes. Father now taking full charge of the business, so he is not needed. Worked on Crompton & Knowles and other machinery used in toweling manufacture. Age 28, first-class reference. 1867, Textile World Record.

Cotton Superintendent wants position. Now engaged, but wishes to change to better condition. Worked on all kinds of plain cotton goods, prints, sheetings, ginghams, etc. Familiar with all kinds of cotton machinery. Will not go West, South or Canada. Age 43, married, first-class references. 2005, Textile World Record.

COTTON SUPERINTENDENTS.

Superintendent or assistant of silk or cotton mill. Worked on plain and fancy ribbons and all classes of goods in broad silks, dress silks and tie silks, also Jacquard work. References. 3185, Textile World Record.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 24; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Superintendent of cotton mill or overseer. Handled all kinds and numbers in yarn mills, cloth mills, colored warps, etc. Speeder, warper, spooler and spinner in the family. Age 48; American; married. 3219, Textile World Record, Boston, Mass.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

Superintendent, or overseer of carding. Worked on combed and carded yarn from 20 up to 140, twilled sateens, lawns, sheetings and shirtings. English and American machinery. 3036, Textile World Record.

Superintendent of yarn mill or plain cotton weaving or assistant. 33 years of age; American. Worked on all classes of yarn up to 50s and plain weaving. Married. 3226, Textile World Record.

Cotton Mill Superintendent. Overseer of weaving on mule spindles. Worked on fancy lenos, jacquards, fancy lappets, plain, fine and coarse cotton goods. Age 36; French-American. 3232, Textile World Record.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

Superintendent of cotton mill, spinning or weaving, assistant superintendent or designer or overseer of weaving, plain or fancy goods. Age 28; English; married; first-class references. 3243, Textile World Record.

Assistant Superintendent in an up-to-date cotton mill. Age 26 years. Textile school education. Single, hard worker and of good habits. Would invest in a paying proposition. 3239, Textile World Record.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent. Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds. 1841, Textile World Record.

Superintendent or Designer. Age 37. English. Married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Superintendent of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as superintendent or designer. Age 45; American; married. Good references. 1932, Textile World Record.

Woolen Mill Manager, formerly of Yorkshire, is open to take a similar position in the United States or Canada. 1976, Textile World Record.

General Manager, agent, superintendent or designer. Worked on everything from fine worsted to a blanket. Good experience. Aged 37; American; married. 3172, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Asst. Agent, superintendent or mechanical engineer in woolen or carpet mill of any kind. Age 30; married. Excellent references. 3178, Textile World Record.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent of worsted yarn plant or overseer of drawing and spinning. Worked on Australian, English, domestic woolens, mohair, alpaca, spun from 8s to 70s, also carpet yarn. Age 38; American; widower. First-class references. 3221, Textile World Record, Boston.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Woolen Superintendent of small mill or assistant superintendent in large mills, or boss finisher, by practical mill man raised in the business. Worked through card room, dressing and weave rooms, and all the departments of finishing. Overseer 20 years; strictly temperate; have family; Scotchman. 3200, Textile World Record.

Superintendent or designer in a woolen or worsted mill. Worked on fine worsted suitings, trouserings, woolen cheviots, meltons, kerseys, coverts, fancy cassimeres, cloakings and dress goods. First-class references. Age 27, married. 1974, Textile World Record.

Woolen Superintendent or overseer of combing, drawing and spinning. Worked on botanies, medium and long wools. Age 44, first-class references. 3086, Textile World Record.

WOOLEN SUPERINTENDENTS.

Woolen Superintendent or designer. Familiar with all kinds of fancy worsteds, dress goods, men's wear, fancy cotton dress goods. Familiar with all kinds of American and English machinery. First-class references. English, age 40. Address 3111, Textile World Record.

Woolen Superintendent or assistant superintendent and designer. Worked on all worsted dress goods, fancy cotton, lenos, worsted men's wear, high grade worsted and piece dyes. Familiar with all kinds of woolen machinery. At present engaged, but would like a better position. Age 34, first-class references, single. 3254, Textile World Record.

Superintendent or assistant superintendent. Is open for a position. Has worked on dress goods, suitings, beavers, broadcloths, carriage cloths and some worsted. Age 33, first-class references. 1575, Textile World Record.

Superintendent of woolen mill. Age 52. Was in business for himself for years. He is now open for a position. Age 52, married, first-class references from commission houses. 3227, Textile World Record.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

Woolen Superintendent or overseer of dyeing or finishing. Worked on all kinds of woolen goods, worsted and union. Age 39. Will not go South or West. First-class references. 1210, Textile World Record.

Woolen Superintendent wants position. Now engaged, but would like to change for a better position. Has worked on all kinds of woolen goods, cassimeres, dress goods, cheviots, kerseys and broadcloths. Age 56, first-class references. 813. Textile World Record.

Worsted Superintendent or overseer of combing, spinning and twisting. Worked on mohair, alpaca, all foreign and domestic wools. Familiar with all kinds of machinery; first-class references. Age 45, married. 3248, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Woolen Superintendent. Worked on worsted ladies' dress goods, cassimeres, kerseys and meltons. Also a first-class man on fancy robes, bed and horse blankets. 48 years of age; married. 1598, Textile World Record.

Woolen Superintendent or designer. Worked on men's wear, worsteds, fancy cassimeres and ladies' dress goods. At present employed, but wishes a better position. 28 years of age; English, single. 3234, Textile World Record.

Assistant Superintendent. Worked on Woolens and worsteds of all kinds. Graduate of a Textile School. American; 23 years of age; single. 3228, Textile World Record.

Woolen Superintendent, manager or designer. Worked on worsted and wool combination, all wool, cotton mixed kerseys, overcoatings and ladies' dress goods. 46 years of age. 3235, Textile World Record.

Superintendent or Manager. Over 35 years' mill experience; last 20 years as superintendent; active, energetic, competent and excellent manager of help. Understands all raw materials, wool, cotton, shoddy, and their values. Also understands carbonizing. Could take a position at short notice. 3279, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married 3029, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

Secondhand Carding or card grinding in a large mill. Worked on all white and colored goods, cotton from 4s to 70s. Good references. Age 29; German; unmarried. 3217, Textile World Record, Boston, Mass.

Overseer Cotton Carding or Spinning desires position Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Overseer of Cotton Carding or superintendent of a small mill. Worked on coarse and fine yarns from 10s to 170s, carded and combed. Will not go West, South or to Canada. Age 37, American. First-class references. 1027, Textile World Record.

Overseer of Cotton Carding. Worked on all kinds of yarn. At present employed in a large mill, but will change for a better position. Familiar with all kinds of machinery. Will not go South. 36 years of age, French. 1991, Textile World Record.

Superintendent or overseer of carding in a large mill. Worked on sheetings, ginghams. Will not go West. Familiar with all kinds of cotton machinery. 41 years of age, American. First-class references. 2021, Textile World Record.

Overseer of Cotton Carding. Worked on plain and fancy coarse and fine white goods. Wants only Rhode Island or Connecticut. 47 years of age, married. First-class references. 1884, Textile World Record.

Second Hand in Cotton Card Room. Worked on all kinds of cotton yarns used for hosiery and sheetings and twills. Familiar with all kinds of carding machinery. German, 28 years of age. Will go any place for a good position. 1718, Textile World Record.

COTTON SPINNERS.

Overseer of Ring Spinning, spooling, long chain beaming, slashing and drawing-in. All kinds of fancies, sheetings, etc. $3.00 per day up. 3202 Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Cotton Spinning or superintendent of a small mill. Would accept any reasonable offer. Worked on all grades of cotton goods and cotton yarns from 20s to 100s. Familiar with all kinds of cotton machinery. 44 years of age, American, married. 1882, Textile World Record.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yar ranging from 24's to 160's is open to a position. .. years old; American. Good references. 2003, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

COTTON WEAVERS.

Overseer of Weaving. Good experience and reference. Worked on lawns, sheetings, sateens, dimities, fancies, etc. 3188, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin, Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Overseer of Weaving. Worked on all kinds of cotton goods, plain and fancy, including Turkish and cotton towels, also fancy worsted dress goods. Age 39; English; married. 3236, Textile World Record.

Overseer of Weaving or loom fixing. Worked on cotton, woolen, silk. Used to Crompton & Knowles looms, both box and plan, Lewiston looms, Mason, Colvin, Whiting, Patterson, etc. Age 43; Scotch; married. 3216, Textile World Record, Boston.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Cotton Boss Weaver, or would accept a position as superintendent or assistant superintendent. Worked on all kinds of sheetings, shirtings, lawns, cambrics, ginghams, checks, stripes, union goods, awnings, ducks, light and heavy weight plain and fancy flannels. American, 39 years old. First-class references. Will go any place for a good position. 3257, Textile World Record.

Overseer of Weaving. Worked on dobbies, fancy shirtings, madras, ginghams, twills and white goods. Will not go West or to Canada. 47 years old, married. First-class references. 3065, Textile World Record.

Assistant Designer, or assistant in the weave room. Worked on plains, twills, sateens and dobby cloth. Familiar with Stafford, dobbies and Whitin looms. Will not go South or West. First-class references. 21 years of age. English. 3230, Textile World Record.

Overseer of Cotton Weaving. Worked on lenos, checks, plaids, fancy stripes, drop box and plain looms. First-class references. Will not go West or to Canada. Age 36, English. First-class references. 1855, Textile World Record.

Foreman of Weaving. Worked on ribbons of all descriptions, silk and cotton labels, tapes and lenos. Will not go to Canada or Maine. Age 34, American. First-class references. 3183, Textile World Record.

Overseer of Weaving, superintendent of weaving or designing. Worked on all kinds of cotton dress goods, also suitings. Familiar with all kinds of American and English looms and machinery. Age 41, English, widower. First-class references. 2058, Textile World Record.

Overseer of Cotton Weaving. Worked on all classes of fancy goods, such as lenos, handkerchiefs, and almost everything in the line of cotton. Can do his own designing. Age 35, married. First-class references. 1642, Textile World Record.

Superintendent or boss weaver in a cotton or woolen mill. Worked on sheetings, shirtings, ginghams, plaids, checks, cottonades and figured jeans. Familiar with all kinds of machinery. 45 years of age. First-class references. 1806, Textile World Record.

Loom Fixer or second hand in weave room. Worked on all kinds of mixed goods, cotton and woolen dress goods, fine lenos, Jacquard and drop box looms. Age 33, French, good references. 3265, Textile World Record.

Superintendent or assistant. Leno, plain and fancy ginghams and sheetings. Wants place at once. 3162, Textile World Record.

WOOLEN CARDERS.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Secondhand in wool card room. Age 23; American. Wool and cotton mixes. References. 3198, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

Second Hand of scouring and carding worsted in a large mill, or overseer in a small mill. Age 24; American; single. First-class references. 3246, Textile World Record.

Woolen Boss Carder. Worked on all classes of goods in hosiery and woolen mill. Familiar with Davis & Furber, Furbush & Cleveland cards; first-class references. Age 35, married. 1501, Textile World Record.

Woolen Boss Carder, or would accept a position as traveling machinist in setting up machinery. Worked on all classes of woolen goods, shoddy mixes, cotton mixes. Worked on Davis & Furber, Cleveland, Lombard, Platt Bros., Furbush & Smith machines. First-class references; age 47; married. 1578, Textile World Record.

Woolen Boss Carder. Worked on all classes of woolen goods, hosiery, dress goods, felts, blankets, cassimeres, satinets, slasher and roller cloth. Age 38; first-class references. Could take a position at short notice. 3258, Textile World Record.

Second Hand in woolen card room. Worked on all kinds of woolens, shoddy and cotton mixes; first-class references. Would take a position in one week's notice. American, age 20. 3241, Textile World Record.

Woolen Boss Carder. Worked on all classes of woolen goods, all wool, all cotton, and cotton and woolen and shoddy mixes. Familiar with all kinds of American carding machinery. First-class references. Age 44, married. 1953, Textile World Record.

Woolen Boss Carder. Worked on all classes of union, cassimeres, beavers. Familiar with all classes of stock. Will not go West. Age 35, married; first-class references. 3174, Textile World Record.

Second Hand in Woolen Card Room. Age 20; American; single. Worked on Davis & Furber cards. Good references. 3241, Textile World Record.

WOOLEN SPINNERS.

Overseer Woolen Spinning. Cassimeres, beavers, kerseys, dress goods, flannels, etc. Good experience. 3177, Textile World Record.

Boss Woolen Spinner. Would take a good secondhand job. Used to Davis & Furber and Johnson & Bassett machines. Worked on all kinds of goods. First-class references. 3215, Textile World Record, Boston.

Woolen Boss Spinner. Worked on all kinds of woolen goods. Familiar with Davis & Furber, Johnson & Bassett and Woonsocket mules. A first-class fixer. Could take a position at once. American; age 48. 3266, Textile World Record.

Woolen Boss Spinner, or would accept a good second-hand position. Familiar with all kinds of American spinning machinery; Davis & Furber, Johnson & Bassett, English mules, Curtis and Platt. First-class references; age 48, English. Could take a position at once. 589. Textile World Record.

Woolen Boss Spinner. Worked on all kinds of woolen yarns; worked on Davis & Furber, Johnson & Bassett, Bridesburg, Platt, and Lees & Moulton machinery. First-class references; English; 45 years of age. 3223, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms Good recommendation. 3066, Textile World Record.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3132, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Woolen Boss Weaver. Worked on worsteds, woolens of all kinds, also dress goods. American; 38 years of age; married. 3231, Textile World Record.

Woolen Boss Weaver. Worked on plain and fancy piece dyed worsted, woolen, plain and fancy flannels, also fancy mercerized rain cloths. 29 years of age; Canadian; married. First-class references. 3251, Textile World Record.

Boss Weaver or assistant superintendent. Familiar with all classes of woolen goods except worsted. Crompton & Knowles looms. Age 48, married, American. 886, Textile World Record.

Loom Boss. Age 32; American; married. Also a designer. Knowles, Crompton, Jacquard and dobby looms. Wants $3 per day. 3150, Textile World Record.

Young Man, American, wants position as boss weaver or assistant superintendent. Has worked on fancy worsteds, cassimeres and cheviots. Can also design. 1712, Textile World Record.

Overseer of Weaving, or would consider a good loom fixing job in a woolen mill. Age 47; Protestant; good references. 3247, Textile World Record.

Overseer of Weaving or designer. Familiar with all kinds of dress goods, lenos, lappets or any kind of fancy Jacquard weaving. Understands all kinds of English and American machinery. Age 46, English. First-class references. 3267, Textile World Record.

Boss Weaver or assistant superintendent. Familiar with all kinds of woolen, worsted, silk and cotton tapestry. Age 35; German-American. First-class references. 3119, Textile World Record.

Overseer of Weaving. Worked on worsteds, cassimeres, dress goods, and all kinds of woolen goods. Crompton & Knowles looms. First-class references; American. 45 years of age. 3262, Textile World Record.

Assistant Superintendent or boss weaver. Familiar with fancy worsteds, cassimeres and cheviots, dress goods and suitings. Can do designing. Familiar with all kinds of woolen machinery. First-class references. Age 38, married. 1712, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Boss Weaver in a woolen mill. Worked for the past twenty years in one of the best woolen mills in Massachusetts and eight years in the same mill for a former company. 57 years of age, married, English, first-class references. No. 3270, Textile World Record, Boston.

Assistant Designer or Boss Weaver in a woolen mill, 25 years of age, for two years was in a first-class Austrian textile school and passed the examination with distinction. Has first-class references, an Austrian and single. No. 3277, Textile World Record, Boston.

DYERS.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Wanted, position as boss dyer and bleacher of cotton yarns, long and short chain and skein yarn. Good references. 3145, Textile World Record.

Dyer. Scotch; married. Cotton and wool skein and hosiery. Mercerizing and bleaching. Excellent references. 3141, Textile World Record.

Dyer on all grades of worsteds, kerseys, broadcloths, knit goods of all descriptions, alpacas, mohair lining, ladies' dress goods, worsted yarn, cotton yarn, wool and cotton raw stock. Age 41; English-American. 3214, Textile World Record, Boston.

Secondhand Dyer. Yarn and cotton pieces. Experienced on all classes of goods on a small scale. Age 23; unmarried. 3171, Textile World Record, Boston.

Overseer of Dyeing on all classes of worsted, woolen and union goods. Can take position on two weeks' notice. Age 26; American; single. First-class references. 3224, Textile World Record, Boston.

Secondhand in dyehouse. Would accept a position as salesman. Worked in first-class worsted and woolen mills. Age 26; American; unmarried. Can take place on short notice. 3211, Textile World Record, Boston.

Overseer of dyeing and finishing, all kinds of worsteds, woolen, fancy mix, indigoes, and raw stock. 36 years of age; married. 3233, Textile World Record.

Boss Dyer in a woolen mill. Has been for the past ten years with one of the largest woolen mills in the Middle States; has first-class references; 47 years of age, American. No. 3286, Textile World Record, Boston.

Boss Dyer in a woolen mill. Has been for twenty years boss dyer for one company, and is familiar with hosiery dyeing. 47 years of age, American, first-class references. No. 3278, Textile World Record, Boston.

Foreman for Aniline Black Department, all silks, cotton, black and taffeta umbrella goods. Age 32; English; married; first class references. 3238 Textile World Record.

Boss Dyer and bleacher. Scotch. Good experience and references. Underwear. 3195, Textile World Record.

Boss Dyer in a 3 to 5 set mill, or secondhand dyer. Raw stock and shoddy. Wants Mass., R. I., or Conn. 3187, Textile World Record.

Foreman Dyer wants position. Age 27; English; married. Cotton and wool in raw stock, wool stock, cotton and worsted yarn and piece dyes, also hosiery. Will not go West or South. Good experience. 3079, Textile World Record.

Dyer. Age 33; Scotch; unmarried. Worked on every kind of woolen cloth, serges, meltons, shoddy worsted and woolen yarn, etc. Wants $5.50 per day. Will not go South. 3064, Textile World Record.

Boss Dyer. A young man; unmarried. Worked on knit goods, raw stock, dyeing wool and cotton. Refers to past employers. 3069, Textile World Record.

Dyer. Worked on all classes of goods, woolens, worsteds, yarn, piece dyes, slubbing, blue vats and cotton mixes. An American; married. 3085, Textile World Record.

Boss Dyer. Has a practical knowledge of the combination of colors and shades and has matched to shade. Steady, sober and industrious. Underwear, piece dyes and raw stock, mercerized goods, wool and cotton. 1513, Textile World Record.

Fancy Dyer. Aged 37; American; married. Cotton, wool and silk. 3158, Textile World Record.

Overseer of Dyeing. Men's wear and dress goods, loose wool, piece dyes and yarns. Good experience. 3161, Textile World Record.

FINISHERS.

Finisher and assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on unions and satinets. Good references. Will not go West, South or to Canada. 3139, Textile World Record.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 3168, Textile World Record, Boston.

Boss Finisher of underwear, cotton or wool mixed goods, who understands Wheeler & Wilson buttonhole machines, Union Button, Union Special, etc., is open to a position in the New England or Middle States. 30 years; American; married. Been employed for a number of years by concern for whom he is now working. Exceptionally good references. 1958, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3128, Textile World Record.

Woolen Boss Finisher. Worked on thibets, cotton and wool warps, satinets, unions, cheviots, kerseys, meltons and cassimeres. Aged 40. Will not go West or to Canada. American. First-class references. 3077, Textile World Record.

Woolen Boss Finisher in a medium-sized mill or second-hand in a large mill. Worked on cassimeres, cheviots, rain cloth, silk noils, dress goods, plain and fancy, piece dyed worsteds and cotton worsteds. Familiar with all kinds of finishing machinery, including crabbing machines. Will go anywhere for a good position. American, 23 years of age, good references. 3263, Textile World Record.

Boss Finisher, or would take a second-hand position or wet finishing. Familiar with all kinds woolen and worsted goods, both steam and dry finishing. Age 45, English, first-class references. 2061, Textile World Record.

Overseer of Finishing, or would take a good second-hand position. Worked on all classes and grades of woolen goods, shoddy mixes, blankets, kerseys and silk noils. Used to all kinds of finishing machinery. Age 32, married; first-class references. 1437, Textile World Record.

Woolen Boss Finisher. Wet or dry. Worked on meltons, kerseys, friezes, cheviots, fancy cassimeres, thibets, men's and ladies' wear, fancy and cotton worsteds, broadcloths, flannels, blankets and rain cloth. First-class references. Age 35, English. 3113, Textile World Record.

Boss Finisher. Worked on broadcloth, cheviots, kerseys, coverts, thibets, meltons, piece dyes and dress goods. Familiar with all kinds of finishing machinery; prefers a position in Massachusetts. Age 28, American, first-class references. 3046, Textile World Record.

Boss Finisher. Worked on broad cloth, cheviots, kerseys, coverts, meltons, piece dyes, dress goods. Prefers Massachusetts, but will go anywhere in New England. Not employed and wants place at once. Young man; American. 3046, Textile World Record.

Boss Finisher in a woolen mill. Worked on kerseys, meltons, cassimeres, satinets, cheviots, etc Wants $3.50 per day. Will not go to Canada or West. 3077, Textile World Record.

Boss Finisher. Mostly on fancy cassimeres and face finished goods. Familiar with most all makes of finishing machinery, in both dry and wet finishing. An expert in overhauling and fixing up old finishing machinery, and at setting up and starting new machinery. 3200, Textile World Record.

KNITTERS.

Superintendent of underwear or boss knitter. Worked on all kinds of underwear from fine to coarse. Worked on all kinds of knitting machinery. Would prefer a position in the West. 51 years of age, English, married. Address 3176, Textile World Record, Boston.

Manager or assistant, or executive position in an underwear mill. Worked on fine wool and cotton knit underwear from raw material to finished product. Some knowledge of hosiery. Will not go West or South. 54 years of age, American, married. 3109, Textile World Record, Boston.

Superintendent of underwear mill or boss knitter. Worked on cotton, worsted. Familiar with latch and spring needle machines. 32 years of age, American, married. 1066, Textile World Record, Boston, Mass.

Boss Knitter in underwear mill. Worked on all gauges as fine as 28, wool, cotton and silk. Latch and spring needle machines. 39 years of age, American, married. 1669, Textile World Record, Boston, Mass.

Superintendent or boss knitter. Worked on latch needle goods, light and heavy weight underwear only. 38 years of age, American, married. 1812, Textile World Record, Boston, Mass.

Superintendent or boss knitter. Worked on men's fine balbriggan, ladies', men's and children's wool underwear. Familiar with all kinds of knitting machinery. 27 years of age, American. 3259, Textile World Record, Boston, Mass.

Superintendent of a knitting mill. Worked on cotton, wool, merino and silk, plain and ribbed hosiery and underwear. Will not go South or West. First-class references. American, 42 years old, married. 1722, Textile World Record, Boston.

Superintendent or overseer in a knitting mill. Worked on all grades and weights of hosiery and ladies' ribbed underwear. Familiar with all kinds of knitting machinery. 49 years old, American, married. 598, Textile World Record, Boston, Mass.

Manager of a Hosiery Mill. Familiar with woolen, worsted and cotton and full-fashioned seamless hosiery. 45 years old, American. First-class references. 1657, Textile World Record, Boston, Mass.

Boss Knitter and machinist. Worked on hosiery, mittens, underwear, fancy shirt bands and shawls. Familiar with all kinds of knitting machinery. German, 39 years old, married. 1059, Textile World Record, Boston.

Boss Knitter on flat and fleeced line underwear. Familiar with all classes and grades of flat and fleece-lined underwear and fancy overshirts. Age 38, Canadian. First-class references. 7080, Textile World Record, Boston, Mass.

General Manager or superintendent of ribbed underwear. Familiar with ladies', gents' and children's ribbed underwear. All kinds of machinery. Will not go South. 32 years of age, American, married. First-class references. 3100, Textile World Record, Boston.

Superintendent or Overseer in Hosiery Mill. All classes seamless hosiery. Understands Branson and Automatic ribbed toe machines. Also Pepper and 3/4 Automatic Excelsior. Age 49; good references. 1441, Textile World Record.

Foreman. A young man of several years' experience as foreman knitter on single and double thread, flat goods, plushes and fleeces, wants a position of any kind where he will have a chance to learn latch needle knitting. No reasonable offer refused. 3038, Textile World Record, Baston.

Boss Knitter or machine fixer. Worked on plain lace and drop stitch hosiery. Good reference; 22 years of age; single. 3237, Textile World Record.

Foreman of Knitting Room. Age 29; American, unmarried. Fleece of all kinds and gauges. Balbriggan from 20 to 30 gauge. Flat work wool goods. Tompkin Bros. and Campbell & Clute machines. Will not go South. 3204, Textile World Record.

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Thousands of men have been promoted and are receiving **higher pay** as a result of studying with the International Correspondence Schools. Their **SCHOOL OF TEXTILES** conducted at New Bedford, Mass., by an expert staff of **Practical Instructors** is devoted solely to teaching Cotton and Woolen Manufacturing and the Weaving and Designing of Fabrics.

Students enrolled after this date receive instruction by means of extended and newly **Revised Instruction Papers** just published and in addition receive a set of invaluable **Bound Volumes** for reference.

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C. P. BROOKS, Principal, Textile Department, International Correspondence Schools, New Bedford, Mass., Box 836:
Please send me a free copy of "1001 Stories of Success" and give me information regarding the Course before which I have marked X.

Complete Cotton Manufacturing	Cotton Designing
Cotton Carding and Spinning	Woolen and Worsted Designing
Cotton Warp Preparation and Plain Weaving	Complete Woolen Manufacturing
Fancy Cotton Weaving	Woolen Carding and Spinning
Cotton Carding, Spinning and Plain Weaving	Woolen Carding, Spinning and Weaving
Yarn Reeling, Winding and Warping	Woolen Warp Preparation and Weaving
Complete Textile Designing	Worsted Warp Preparation and Weaving
Theory of Textile Designing	

Name.....
Occupation..... *Age*.....
House Address.....
Business Address.....
City..... *State*.....

MISCELLANEOUS.

Designer, assistant superintendent or boss weaver. Familiar with all kinds of worsted dress goods, fancy cotton waistings, corduroys, worsted suitings and cassimeres. Familiar with all kinds of dressing and winding. English and Crompton & Knowles looms. 32 years old; English; first-class references. 3080, Textile World Record.

Designer. Familiar with all kinds of fancy and plain sateens, lenos, checks, fancies of all kinds. Familiar with all kinds of American and English machinery. Age 44, married. First-class references. 3043, Textile World Record.

Dyer, bleacher and washer. Age 30; American; married. Cotton print goods in either the roll or garment, long and short hose, raw stock and yarn, aniline or oxidized black on hosiery. Good references. 3081, Textile World Record.

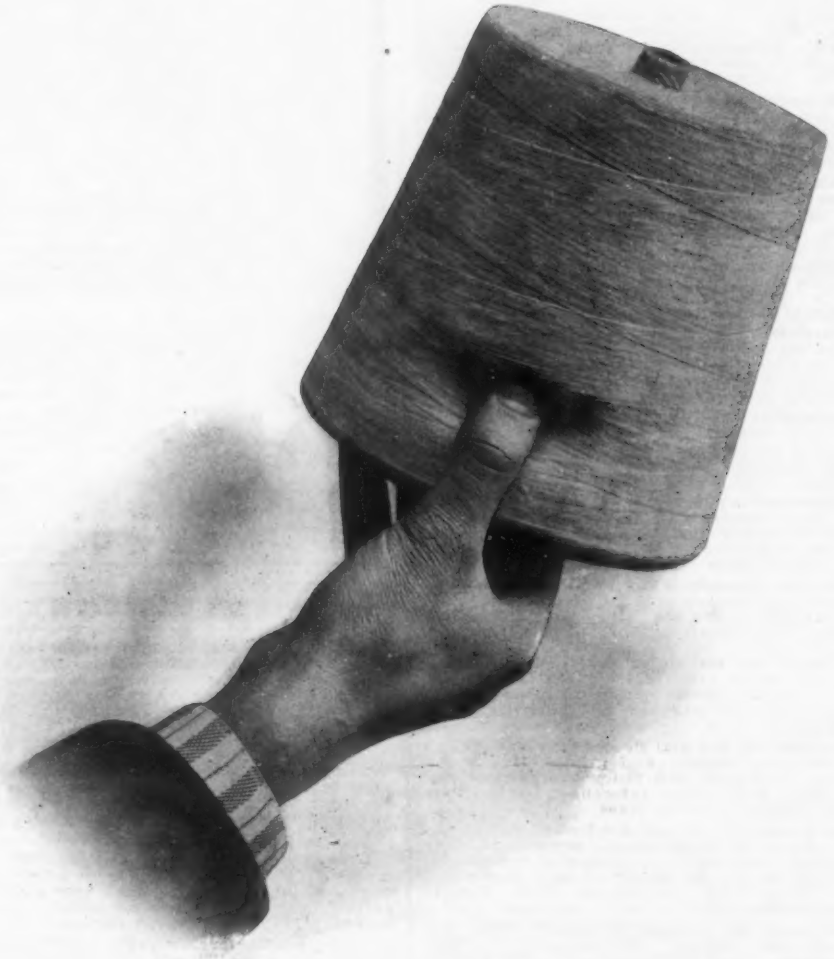
Assistant Master Mechanic. Age 25; American, single. Used to all kinds of textile mill machinery. Can take position immediately. 3207, Textile World Record, Boston.

A Middle Aged Englishman, thoroughly understanding how to operate and fix jacquard and box looms, and prepare designs and pattern cards therefor, is open to accept a position this month. 3135 Textile World Record, Boston.

Boss Dyer and Bleacher. Age 34; English; married. Yarns, warps, knit goods. Can give good references. Wants $4 or more. 3020, Textile World Record.

Overseer of Winding, filling, warping or spooling. Has had considerable experience in keeping mill books. Would consider position taking charge of shipping. American; age 26; single; good references. 3242, Textile World Record.

Soft Spun Yarn



is Soft Wound on
UNIVERSAL CONES

UNIVERSAL WINDING CO., 95 South St., Boston.

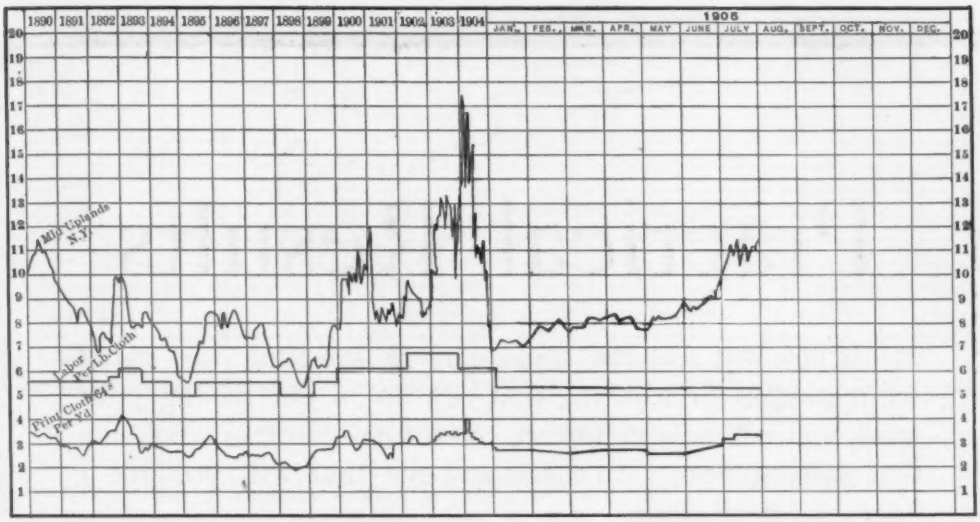

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth Per Yd.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

The cotton trade during the last month has been demoralized by the loss of faith in government reports. For some time these government estimates have been accepted with increasing faith on both sides of the Atlantic, but recent developments indicate that the official figures have been misleading and have served the purpose of a few speculators. Since the recent abrupt awakening to the truth, the trade has given undue weight to irresponsible reports as to acreage and condition, the result being an erratic market and a strong tendency to believe the worst reports about the new crop. As this report is written the trade is taking a somewhat calmer view of the situation and middling uplands has receded from the highest point reached.

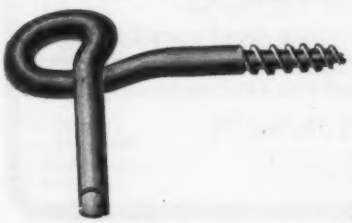
It is generally conceded that there is no chance of another bumper crop this season, such as saved the world from a cotton famine last year, but the conditions are somewhat different now from what they were a year ago. The visible supply then was 1,594,667 bales, now it is 2,991,351 bales, or about 1,500,000 bales more. Moreover, the invisible supply is unquestionably much larger today. This means a substantial increase, and will go far to supplement a short crop this year. There are other factors to be reckoned with, however. One

MITCHELL-BISSELL CO.

38 MURRAY STREET, NEW YORK.

PORCELAIN, ENAMELLED IRON AND GLASS FOR TEXTILE MACHINERY.

Right Angle Pontiac Guide.



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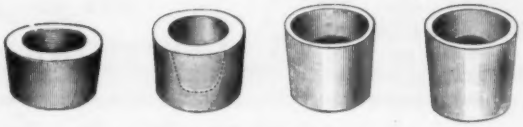


143 704 258 5219

Creel Steps.

E 8

Practical Results

If you will use the same care in selecting and using the materials for scouring that you do in purchasing your wool, you will be able to turn out a finer grade of wool, one that will spin into yarn easier and one that will produce a finer quality of cloth.

Wyandotte Textile Soda

is the product that will produce these results. When we stand ready to prove these statements, and all we ask is the opportunity to make a practical demonstration without cost to you, why should you hesitate? When these statements are proved to you, you will be as anxious to use Wyandotte Textile Soda as we are to have you. Then order from your supply house or write us when we can make this demonstration for you.

None Genuine except with a card bearing this Trade Mark

In Every Package.

THIS SODA WAS AWARDED THE HIGHEST PRIZE—GOLD MEDAL—AT THE ST. LOUIS EXPOSITION.

The J. B. Ford Co.,

SOLE MANUFACTURERS,

Wyandotte, Mich.

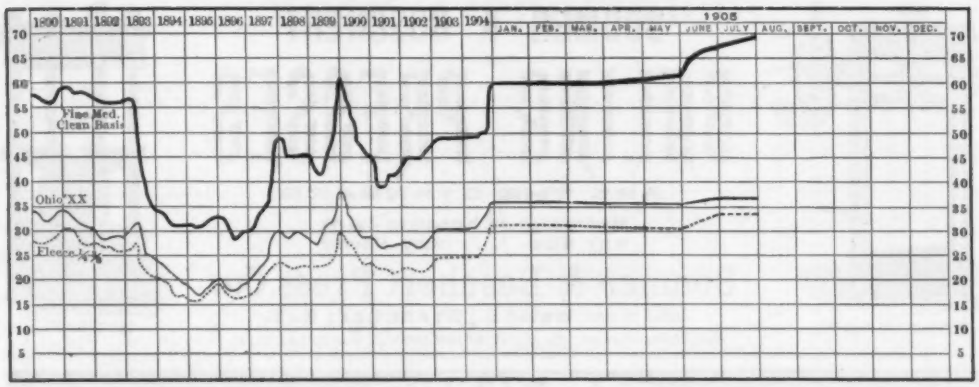


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

is the increased consumption of cotton; another the possibility that unfavorable weather in the South may reduce the crop to a greater extent than now seems probable. Seldom has there been a more trying period for cotton manufacturers as far as the supply of raw material is concerned. The one fact that stands out clearly is that the world needs a great deal more cotton than is being grown. The high prices of last year and of the present are the indications of this fact, and until the supply is materially increased lower prices are not likely to prevail for any great length of time.

The movement into sight for several years is estimated by the Chronicle as follows:

1905	13,116,786 bales
1904	10,015,464 bales
1903	10,621,142 bales
1902	10,248,525 bales
1901	10,271,951 bales
1900	9,048,843 bales

The world's visible supply is estimated on July 28 by the same authority at 2,991,351 bales, as compared with 1,594,667 bales in 1904, 1,728,119 bales in 1903 and 1,761,192 bales in 1902.

Wool Market.

Wool has advanced sharply and fine medium territory is now selling at 70 cents per pound, or 8 cents above the point reached at the height of the boom in December, 1899. History may repeat itself and the near future be a repetition of the disaster of 1900 and 1901, but it is by no means certain that this is to be the case. Six years ago the rise in the price of wool had no such substantial basis as exists today. At that time there were large stocks of wool in dealers' hands, and the demand was too small to prevent the decline. Now the country is short of wool, while the demand is large and increasing. The last clip has been transferred to the possession of manufacturers with unprecedented celerity.

There has been a marked absence of trading between dealers, and a large proportion of the clip has been sold by the growers directly to the spinners without the assistance of middlemen. There is no data to indicate the size of the clip that has just been marketed, but the general opin-

Wool and Woolen Goods Made **NONSHRINKABLE**
by the use of "Nevershrink Process."
May be applied at any stage of manufacturing. Write for Booklet.
CHARLES H. HEYER,
1501 Real Estate Trust Bldg. Philadelphia, Pa.

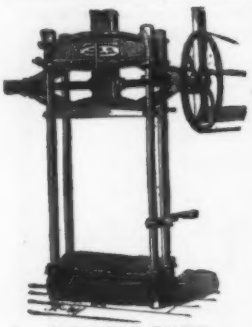
STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes.

Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.

FRANK A. TIERNEY,
Wool, Tops, Noils, Yarns.

Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns.

All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.
Room 203, Wool Exchange Building, 260 West Broadway, New York.



KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

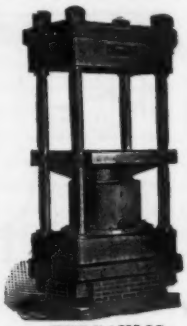
ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.



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DE HAVEN'S ALL STEEL TRAVELERS

Less Friction

More Even Counts

longer life of the traveler and big saving in fluff, on account of the close fine grain of the De Haven all steel TRAVELER are a few of the claims that we make for our product.

If you are using anything but a De Haven TRAVELER, you are not getting the good results nor as satisfactory work as those who do use them

The use of our traveler means money saved.

DE HAVEN MFG. CO.,
50-52-54 Columbia Heights, Brooklyn N. Y.

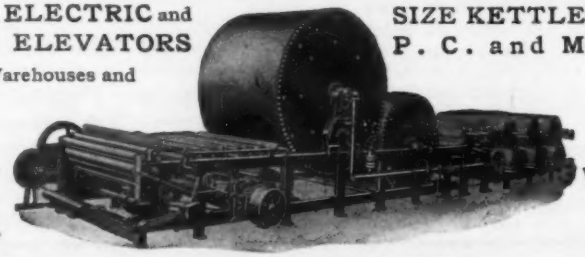
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO., Cohoes. N. Y.

A Crosby Indicator

In the Hands of a Competent Man Will Increase the Efficiency of Your Plant and Cut Down Your Coal Bill. Faultless in Design. Perfect in Workmanship.

Write for Catalogue.

TRADE MARK CROSBY

Pop Safety Valves
Pressure and Vacuum Gages
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Rubber Pump Valves

Recording Gages
Single Bell Chime Whistles
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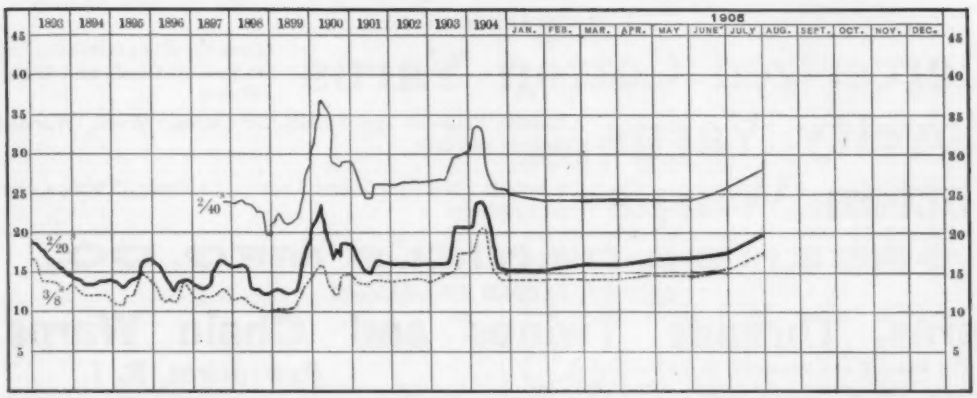
Lubricators—Oil Cups
Gage Glass, Water Gages, Etc.

CROSBY STEAM GAGE AND VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

ion is that there has been no material increase in the domestic supply. The demand has been met by an increase in imports of wool. For the eleven months ending with May of this year the foreign wool brought into the country amounted to 219,333,662 pounds, which is at the rate of 237,611,467 pounds per year, a total above that of any previous year with the exception of 1897, when an unusually large amount was brought into the country in anticipation of the Dingley bill going into effect. The woolen goods market is strong and advances have been made on many lines since the opening of light weights. The buying in some cases has resembled a scramble for goods, but this has been the exception, and there are a large number of manufacturers anxious to receive any orders that buyers are prepared to place.

The foreign market is strong, the firmness being caused to a large extent by the increased purchases for the United States. With the domestic supply stationary, the domestic demand increasing and the tariff unchanged, it is difficult to find any reasons for a decline in wool. Of course, the safety valve afforded by wool substitutes will prevent any such calamity as a wool famine. Already there is a perceptible increase in the activity of mills making low goods.

Eastern Yarn Market.

The advance in cotton yarn has checked sales for the present. Buyers are holding off in the hope that a decline in the raw cotton market may occur. The advance has been so rapid that the trade has not yet had time to adjust itself to the new situation. A large proportion of both the weavers and knitters have yarn on hand for their immediate requirements and are in a position to play a waiting game for a few weeks. There are many indications that such a policy may prove very expensive in the end. It is fairly certain that the new crop will be much below the last one. Consumption of raw material is now larger than ever before, and bad weather may reduce the crop below the estimated 10,500,000 bales.

Certainly if it is unsafe for buyers of yarn to pay present prices, it is still more unsafe for spinners to sell yarn for future delivery to reduce prices and rely on a decline in raw cotton to enable them to cover their sales. Spinners claim that the present quotation for cotton and yarn do not afford more than a fair profit, while weavers and knitters assert as positively that they cannot secure an advance on cloth or knit goods to correspond with the advance in the yarn market. We quote as follows:

Eastern Cops.

6's	17
8's	17½
10's	18
14's	19
16's	19½
18's	20
20's	20½
22's	21
24's	21½
26's	23
30's	24
34's	25
36's	25½
40's	26½

On cones, ¾c. more up to 14's; 1c. more from

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

WALCOTT & CAMPBELL SPINNING COMPANY

Fancy Hosiery Yarns
IN ALL COLORS

New York Mills, Oneida Co., New York.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.

HIGH GRADE HOSIERY YARN
White and Colors. All Numbers.

Sewing Twines on Cones and Tubes.

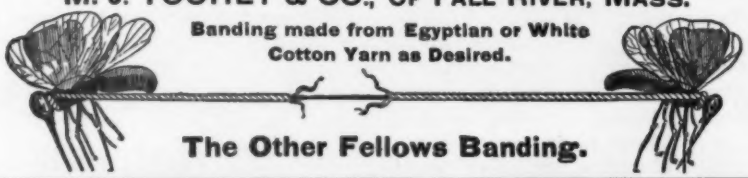
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.

CANNON MILLS, 55 Leonard St New York.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

4s to 60s.

HOUSATONIC, MASS.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	20
14's	21
18's	22
20's	23
24's	24
26's	25
30's	27
36's	28
40's	30
45's	33
50's	36
55's	40
60's	43

Eastern Two-Ply Warps, Carded Peeler.

2/30's	28
2/36's	29
2/40's	31
2/45's	34
2/50's	37
2/60's	44

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	31
36's	32
40's	36
45's	39
50's	42
55's	45
60's	48
70's	58

Two and Three Ply Skeins, Combed.

30's	36
36's	38
40's	40
45's	43
50's	46
55's	49
60's	52
70's	62

Philadelphia Yarn Market.

The yarn market has been very strong and active the last few weeks. Business has been exceptionally good on all lines of knitting and weaving yarns, particularly on two-ply yarns. Spinners are well supplied with orders and are standing for an advance of 3 to 4c per pound, above the low prices touched during the spring. The volume of new business at the full advanced price has not been very large, but it has been fair and at present the yarn market is ruling strong. Manufacturers report that it is impossible to secure new business at any advance.

All reports of the cotton situation seem to indicate a smaller crop for this year than the average, which will undoubtedly mean high prices for cotton for some time to come. Spinners are not asking an unreasonable price for yarn, based on

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 155 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS
MERCERIZED YARNS } ALL NUMBERS FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

SPINNING MILLS:
NEW BEDFORD, FALL RIVER, TAUNTON.

DYE AND BLEACH WORKS:
FALL RIVER, TAUNTON.

NEW ENGLAND COTTON YARN CO.

KNITTING AND
WEAVING YARNS

EVERY DESCRIPTION AND FORM
Gray, Bleached, Dyed and Mercerized
600,000 MULE AND FRAME SPINDLES

C. MINOT WELD, President.
HENRY C. SIBLEY, Treasurer.

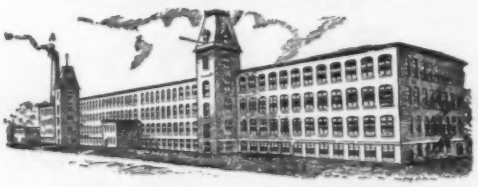
ARTHUR R. SHARP, General Manager.

Executive Office:
141 Milk Street, Boston.

BRANCH OFFICES:
ALBANY, Broadway, cor. State St.
CHICAGO, cor. Clark and Adams St.
NEW YORK, 73 Worth St.
PHILADELPHIA, 213 Chestnut St.

C. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS



Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

JENCKES SPINNING CO.,

Formerly E. JENCKES MFG. CO.

Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.

PAWTUCKET, R. I.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

Indian Orchard Company
Cotton Warps and Yarns.
In Gray and all Colors, Single or Two or more Ply, and Cable Cord.
Novelty Yarns.
In Various Patterns, Colors and Twists.
Carded and Colored Cotton.
For Mixing with wool, Machined or in Roving.
Indian Orchard, Mass.

the present cotton market. Prices today are about as follows:

Southern frame spun cones:—	
7's and Coarser	17½
8's and 9's	17½
10's	18
12's	18½
14's	19
16's	19½
18's	20
20's	20½
22's	21
24's	21½
26's	22
30's	23
40's	28
50's	34
Southern high grade mule yarn:— Cones.	
10's	19
12's	19½
14's	20
16's	20½
18's	21
20's and 22's	22½-23
24's	24
Southern frame yarn, lower grades:—	
6's and 8's	17½
10's	18
Eastern cones (high grade quality):—	
10's	19½
12's	20
14's	20½
16's	21¼
18's	21¾
20's and 22's	22¼-22¾
Skein yarn (mostly Southern):—	
4's to 8's soft	18
10's to 12's	18
14's to 20's	18½-19½
22's	20-20½
14/2	19½
16/2	20
20/2	22
30/2	25
40/2	29
16/3 slack	20
12/3 slack	19½
8/3 carpet	18
8/3 slack	18
9/4 slack	18
Warps (Southern):—	
10's to 12's	18
14's	18½
16's	19
20's to 22's	19½-20
26's	21
14/2	19½
16/2	20
20/2	22
24/2	23
30/2	25
40/2	28
Mixed colored yarns (mock twist, half colors):—	
6's to 10's	19-19½
12's to 14's	20-21
16's to 18's	21½-22

Mock Egyptian, 2c. advance over white.
Egyptian, 4c. to 5c. above best quality white.

O. K. SOAP CO.

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FINE TEXTILE SOAPS,

SILKINE,

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Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps, Cones, Cops, Tubes
COTTON YARNS
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Ballou Yarn Co.

PROVIDENCE, R. I.

Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.

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American Cotton Yarn Exchange

COMBED and CARDED COTTON YARNS

From Northern and Southern Mills.
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WORSTED YARNS

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Office
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CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors,
in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

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French System. **B. F. BOYER CO.,** Bradford System.

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Yarns and Braids
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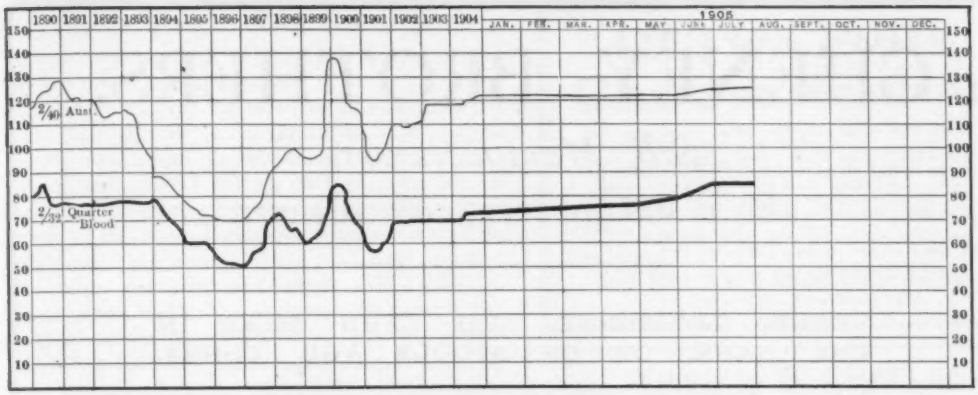


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

Worsted Yarn.

The present is one of uncertain conditions. Many of the worsted spinners report that they are sold up and will take no more orders. This cannot be wholly verified, and although this is a worsted season so far as men's wear is concerned, it is doubtful if it is the case with the Bradford system spinners. So far as the French worsted yarn is concerned, it would not be surprising if this statement was a true one. Certain it is that there is much French spun yarn being used by the weavers of mercerized worsteds for filing, the warp of this cloth being either wholly cotton or cotton and worsted twist.

The men's wear weavers have secured many orders for this class of cloth, which displaces much of the fancy worsted cloth using solid worsted yarn. Many buyers are ordering this cloth to replace fancy worsteds, because they say the cloth suits their trade and the price at which it is sold suits their pocket. The French spinners are getting through this business new outlets for yarn which must necessarily displace English spun yarn.

Many thousand yards of cotton worsted cloth have been sold and the bulk of the great men's wear business that is now on has been secured on these cotton and mercerized worsteds. This cloth, although sold at a popular price, brings good profit to the weaver. Of course, some solid worsted serges have been sold and some of the weavers having sold their cotton lines well up and being desirous of holding their trade on all worsted cloth, put samples on the market at high-going prices and easily sold their surplus production.

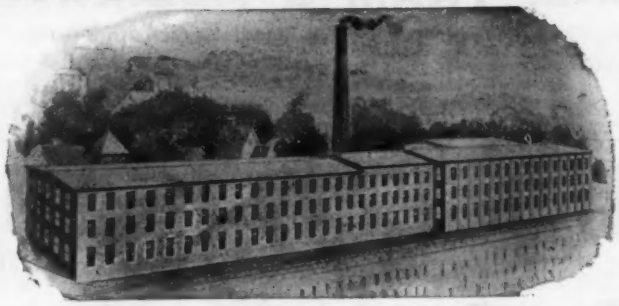
Spinners of Bradford spun yarn have undoubtedly secured new orders which will hold them sixty days longer, but the high price of wool is making them cautious about taking orders too far ahead. The highest proportionate wool is that which goes

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



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DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

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Pure Dye and Fast Colors Warranted.

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Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

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Fast Dye Organzines for Woolen Manufacturers a Specialty.

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into quarter blood yarn. It is an acknowledged fact that this grade is entirely out of proportion and the wool dealers will find this to be the case within the next four months.

Spinners of yarn for men's wear state they are very busy, but the same cannot be said of dress goods manufacturers. We know weavers of dress goods who stocked well up on No. 2/36's, but not getting the business anticipated, they have sold off much of this yarn to weavers of men's wear, giving the buyers the benefit of the low value at which the yarn was purchased, which shows that the dress goods end of the business is showing a falling off on worsted yarn. We note in this connection that the dress goods manufacturers are making mercerized men's wear cloth to keep going and are getting out lines of dress goods, using cotton twists such as 1/80's combed Sea Island twisted with a 2/20's black cotton.

The knitters seem to be in the worst predicament. The high price for worsted yarn is hitting them hard. For the last three or four seasons the conditions have been with them, and in consequence they have in no way felt the changing yarn prices. At present their contracts have run out and they will order yarn only as they require it in small amounts. This, however, will not bother the spinner who has other lines elsewhere These manufacturers of hosiery must make hosiery to fit a standard price and when there comes an advance the only way out is to lower the grade as the yarn advances. Top combers are busy and are working overtime to get out work. Prices are well maintained. We quote as follows:

2/40s Australian	1.28
2/40s Delaine	1.23
2/36s 1/4 to 3-8 Blood	97½
2/32s 1/4 Blood	84
2/20s 1/4 Blood	75-82

Woolen Yarn.

Spinners of woolen yarn are beginning to slow up. They report that the present season is one of the worst they have experienced in years. The woolen weavers are getting no orders. The cloth buyers say that this is a smooth cloth season and woolen cloth or rough cloth is unsalable. Many

YARNS Solis, Boston.
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SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

Of Two Evils, Choose Neither!
Don't use fluid oils, and oil your belts, your floors and your goods, as well as your bearings.
Don't use greases, which don't feed till the bearings grow warm, and leave a gummy residue behind, causing an increase of 25 or 30 per cent in the friction load.
Use NON-FLUID OILS, which don't drip like the corresponding fluid oils, nor inflate your coal bill like greases.
Our booklet tells why. May we not send it to you, with free samples to prove our claims? Better write to-day.
NEW YORK & NEW JERSEY LUBRICANT CO.,
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Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
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YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
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Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

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Carbonized Stock a Specialty. **FLOCKS**

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Sufficient for 40 sq. ft., $5; 125 sq. ft., $12.

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of the spinners who have been depending on this class of trade are either running only part machinery or have found other outlets for their machinery space.

Knitters are lowering the quality to such an extent that it is only with great difficulty that yarn at the required size can be spun, and in consequence where the work is done on commission the spinner finds it difficult to produce the yarn and get back a new dollar for an old one. Many of the knitters are short of material, whether it be yarn or wool. All bought as much as they could at low prices, but have now cleaned out their stocks, and if there should come a steady demand for underwear the advance would be immediate. Should late orders come, it would be impossible to get stock and fill orders promptly.

More light weight flat wool or merino underwear has been made at the present time than has been the case for many years.

Some hosiery manufacturers who were forced on the market to buy fine woolen yarn found the price had advanced from a year ago 20 cents per pound.

The present is a between-season period and after August new developments are expected which may change the whole situation. Many orders must be placed as many buyers have been waiting for lower prices. The spinners must expect quiet times until the heavy weight season begins.

Rag and Shoddy Market.

The advance in prices of both rags and shoddy has been firmly maintained, and dealers are predicting a further rise. An encouraging feature is the continued demand for stock to complete orders on heavy weight goods. This trade will go far to fill up the gap usually caused by the light weight goods, into which but a small amount of short wool stock can be worked. Rag dealers are not pushing the sale of their stock and act as if they had the utmost confidence in the upward course of the market. The shoddy mills are busy, in many cases running both night and day to fill orders. The activity is especially noteworthy at this season of the year, when business is usually dull. The advance in wool is another good feature of the situation. With wool selling on a basis of 70 cents for fine mediums, there is no escape from the conclusion that wool shoddy must be used in increasing volume. It would not be strange if a period of dulness occurred before the new heavy weight season began, but this is to be expected at this time of year. Wool waste is strong, with the supply short. Desirable lots are quickly picked up and many of the mills that have been in the habit of selling their waste are now working it into their products. Cotton waste is quiet and the recent advance in cotton has had but slight effect on the price of waste. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	44-47
White knit, all wool, best, fine	35-40
White knit, No. 2	30-35
Light yarn, extra fine	30-35
New pure indigo blue	28-30

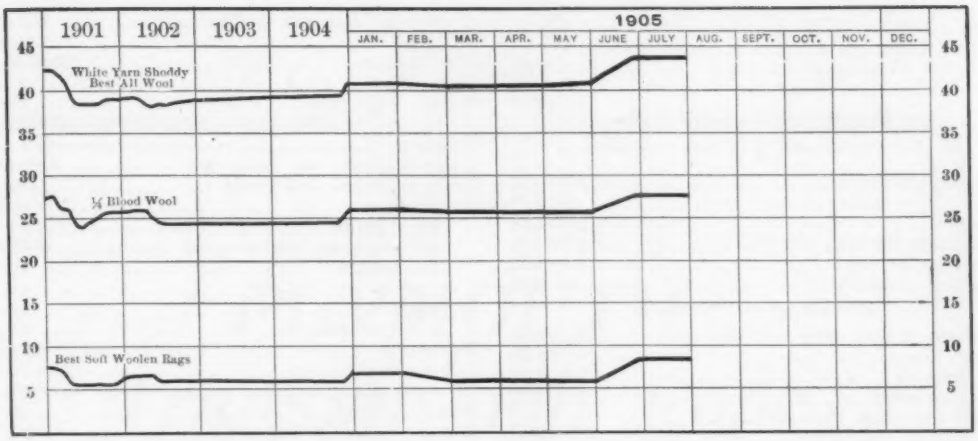

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Merino.

Fine light, all wool, No. 1	26-28
Medium light, all wool, No. 1	18-20
Medium light, all wool, No. 2	16-18
Fine black, all wool	25-27
Fine dark, all wool, best grade	22-25
Medium dark, all wool, No. 1	18-20
Medium dark, all wool, No. 2	15-16
Red knit stock, strictly all wool	20-22
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	20-22
Dark blue for hosiery, not all wool, No. 2	15-18

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Fancy colors	16-20
Fine merchant tailors, all colors	8½-9½
Choice light colors	12-13
Browns	12-13
Blacks	8-8½
Fine blues, plain	9-10
Fine dark	9-10
Medium dark	6-7

Worsteds.

Blue	15-16
Black	20-22

Serges.

New black	15-17
New blue	14-16

Flannels.

New scarlet	19-20
New blue	15-16
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	8¾-9½
Old white flannels	20-22
White flannels, No. 2	11-12
Old red flannels	12-13
Light blue flannels	7½-8½
Old blue flannels	6¼-7
Fine worsted, new black	20-22
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	20-22
White hood stock	20-22
Clear hoods	9-10
Red stockings	12-13
Blue stockings	8½-9
Fancy stockings, No. 1	9½-11
Gray stockings	9½-10½
Black stockings	10½-11½
Knit stock comforters	7-8
Red knit	12-13
Light gray knit	9-10
New light fancies	14-15
New fancies	11-12

Merinos.

Light, fine	16-17
Light, coarse	7½-8
Fine, dark	12-13
Coarse, dark	7-7½
Blue	11-12
Blue—seamed	13-14
Black—unseamed	13-14
New black	18-20
Small	4-5
Bunting	8½-10

FLOCKS.

Shear, fine white, all wool	10-12
Fine indigo blue, all wool	7-8
Fine black, and blue, all wool	6-7
Fine dark, all wool	2½-4
Gig, fine, all wool	2-3
No. 1 black, all wool cut	6-10
All wool, fancy, shear and gig	2-3

COTTON WASTE.

No. 1 Spinners	10-10¼
No. 1 Machine	6¼-6½
No. 2 Machine	5-5½
Machine Cop	9-9½
No. 1 Cop	8¾-9
No. 1 Card	6-6½
No. 2 Card	5½-6
No. 1 Oily Card	5½-6
No. 2 Oily Card	4-4½
Peeler Combing	10-10¼
Egyptian Combing	10-10¼
No. 1 Linters	5½-6

No. 2 Linters	4½-5
White Clips	4½-5
Colored Clips	1½-2¼

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.60-4.05
Citric, domestic	38-38½
Oxalic	5.00-5.10
Sulphuric, 60 deg., 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	29-29½

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.35-2.40
Alum, lump	1.75-1.80
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia, 16 deg.	3¼-4
Ammoniac, sal., gray	5¾-6
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	20.00
Copperas	52½-65
Cream tartar, crystals	23½-23¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	25-45
Potash, chlorate, crystals	8¼-8¾
powdered	8⅜-8⅞
carbonate	4-4¾
Soda ash, carbonate, 48 per cent	1.20-1.30
high test	1.00-1.25
Soda, bicarbonate, English	
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	55-70
Sulphate, alumina	90-1¾
Vitriol, blue	4.80-5.10

Dyestuffs.

Acetate of soda	4-4¼
Acid, picric, best crystals	22-28
tannic, commercial	35-37
Albumen, egg	46-65
blood	21-28
Alizarine, red	15½-16
Aniline oil	10-10¼
salt crystals	8¾-9
Antimony salt, 65 per cent.	13-15
Bichloride of tin, 50 per cent	9½-9¾
60 per cent.	13-13½
Bichromate of potash, American	8¼-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	1-1½
Cutch, mat	4½-6
boxes	5-8
Dextrine, imported potato	6½-7½
corn	2.35-2½
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	18-20
young root	31.00-35.00
Gambier	4¼-4½
Hypo. of soda, Am. bbls. cwt.	1.50-1.60
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's, medium to good	47½-60
Gautemala	35-70
Manila	43-45
Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	15.00-19.00
roots	14.00-16.00
Madder, Dutch	7-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	21-23
Persian berries	
Phosphate of soda	1.90-2¼
Prussiate of potash, yellow	13½-13¾
Quercitron, ton	18.00-20.00
Starch, corn, pearl, bbls.	1.80
corn, pearl, bags	1.65
potato	3½-4
rice	6½-7½
wheat	5-6
Stannate of soda	10-20
Sumac, Sicily, No. 1, ton	45.00-47.00
Sicily, No. 2, ton	42.00-44.00
Tapioca flour	1¾-2¼
Tin crystals	22½-24
Tumeric, Bengal	3¾-4
Zinc dust	5⅜-6

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(WM. J. BUCKLEY) **Gun Mill, Patterson, N. J.**

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Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

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Since its introduction transmission by means of ropes has steadily grown in favor, and the qualities of efficiency and economy have won for it a place of high regard among mill owners and engineers.

There is hardly a textile mill in the country that does not offer some opportunity for the use of rope drives and we gladly place at their disposal the results of our long experience in this line.

If you have transmission problems of any kind, write us, and your questions will have the careful attention of our Engineering department.

Our book on "Rope Driving" will be valuable to anyone at all interested in the subject. Write for it.

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TURKISH TOWELS, SKEIN YARN, TAPE, UNDERWEAR.

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DYERS, BLEACHERS AND **MERCERIZERS**

OF COTTON WARPS AND SKEIN YARNS.

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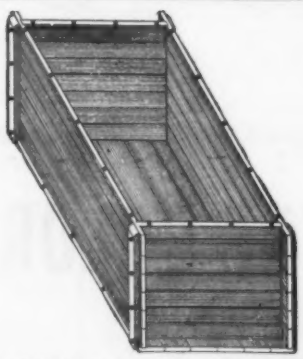

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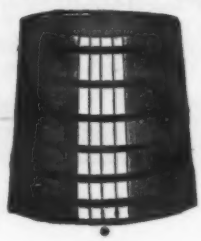

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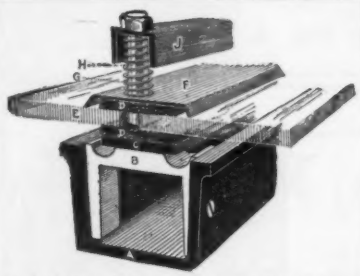

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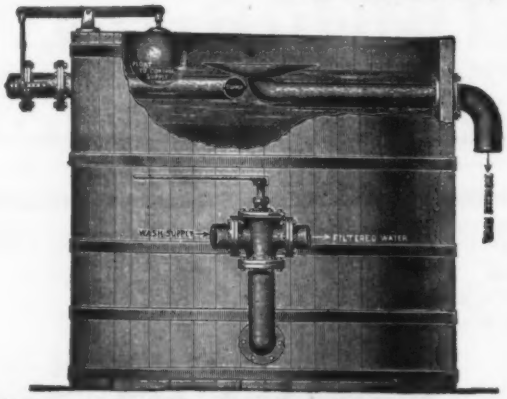

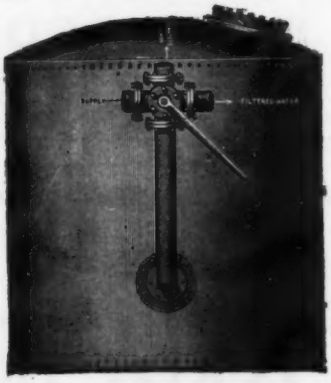

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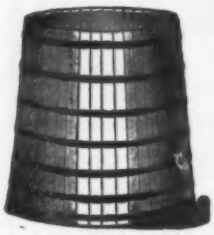

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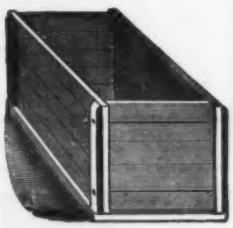

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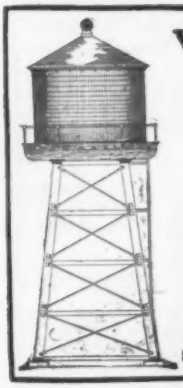

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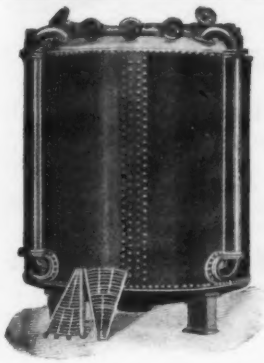

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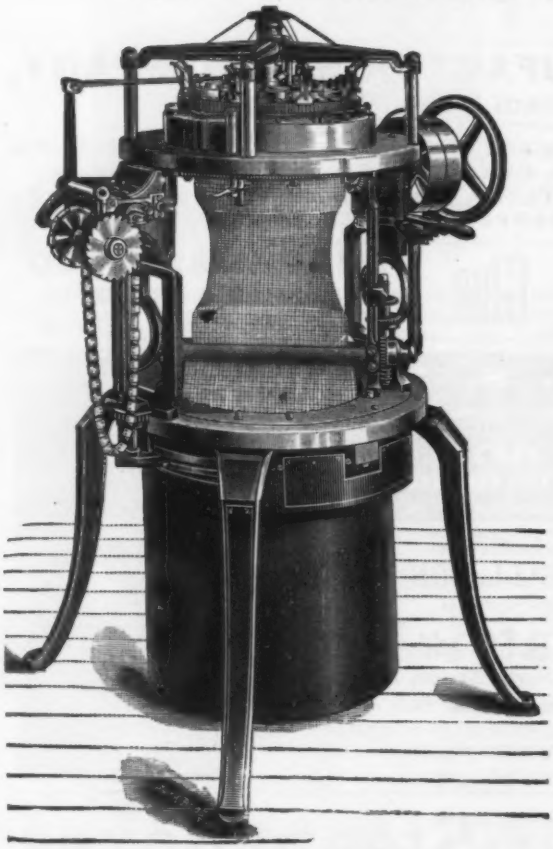

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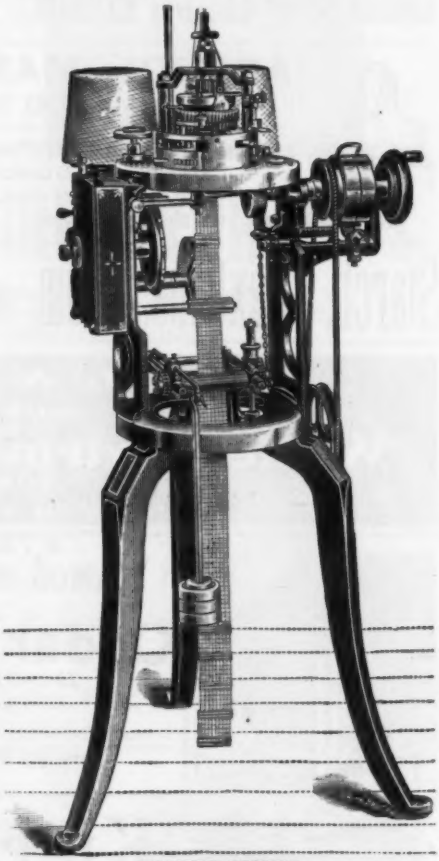

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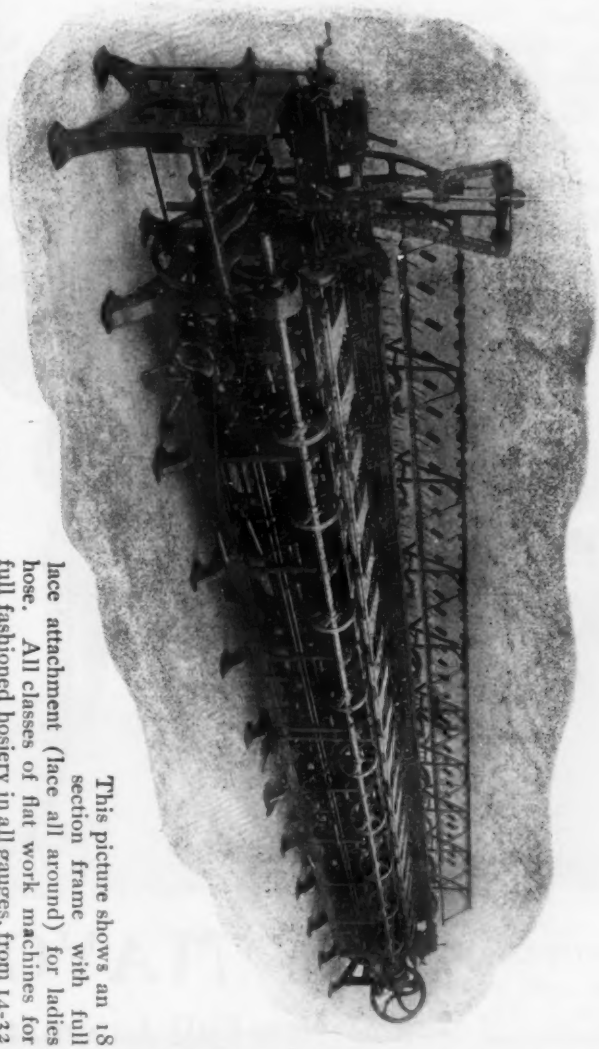

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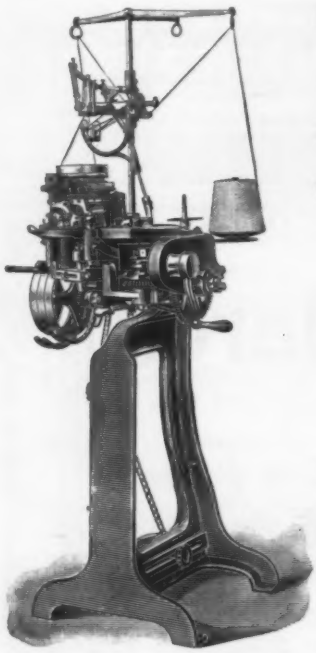

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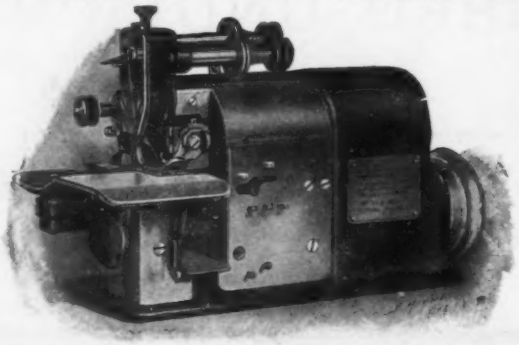

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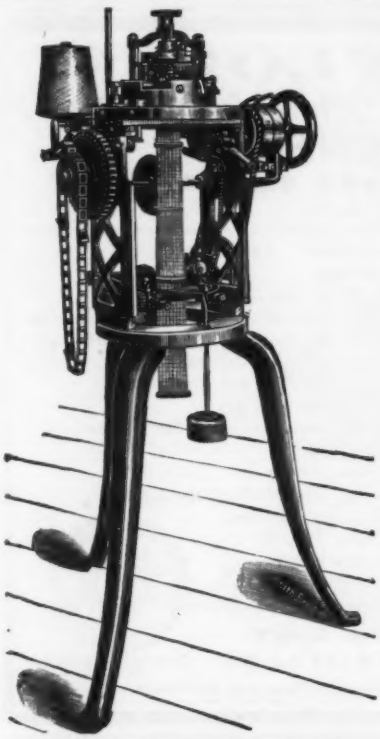

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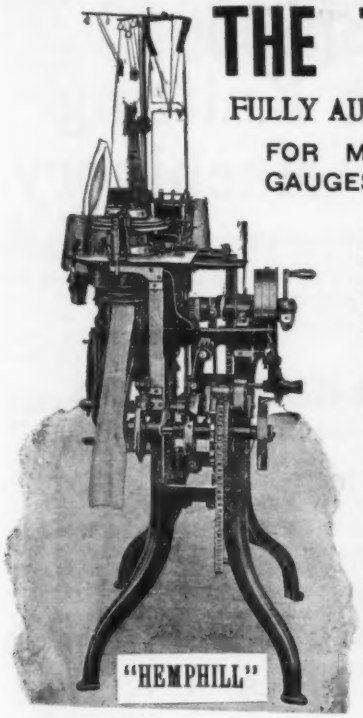


One with **GEARS**, the other with **CHAIN** for pattern mechanism, to meet the various tastes of different manufacturers.

Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

Write us for further particulars and prices.

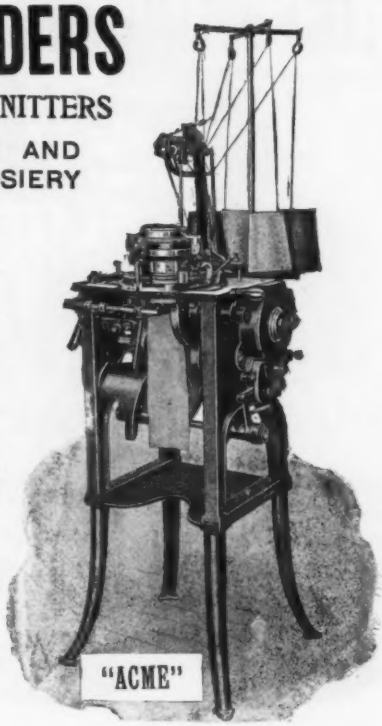
We also make all kinds of **LATCH NEEDLES.** Many leading manufacturers use our needles and say they are the best on the market. Send us a trial order.

MAYO

Knitting - Machine and Needle Co.,

FRANKLIN FALLS, N.H.

Philadelphia Office, Knickerbocker Bldg., Cor. 6th & Arch Sts.



JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

A RARE OPPORTUNITY TO BUY.

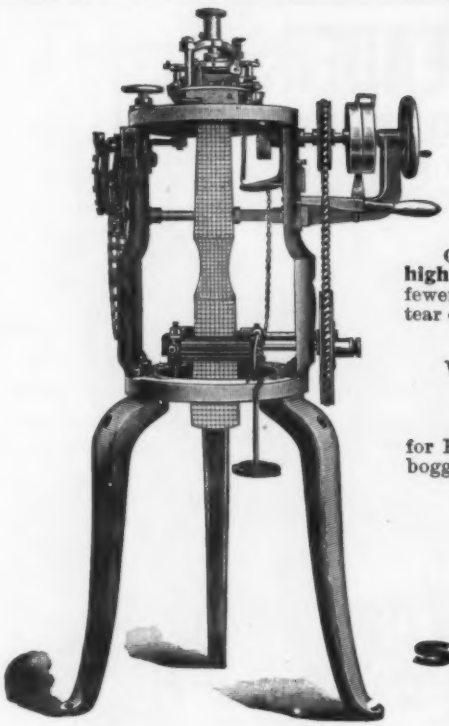
20 Payne 48 Spindle Spoolers.
2 Payne 48 Spindle Cop Winders.
50 Scott & Williams ¾ Aut. Knitters.
1 Fireproof Safe.
1 Back Geared Lathe, 6 ft. x 18 in. Swing.
2 Newman's Watchman's Clocks.
1 Westinghouse 25 H.P. Engine.
1 Complete plant; 500 per day of ladies', gents' and misses' hose. Modern mchy.
28 Beattie & Hepworth & Abel loopers.
6 Hosiery presses (lever).
4 Lamb and Grosser sweater machines.
200 Ribbed underwear machines, various sizes.
50 Brinton & Co. ¾ aut. knitters, sizes.
24 Standard B machines.
50 Union Special machines, various styles.
1 Rotary fire pump.

100 Mayo machines. Various sizes.
100 Brooks welters.
4 Fleecing machines. (Nappers.)
98 Brinton & Co. and other make hosiery ribbers.
1 40-Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 10 plate Crawford press, 32 x 43.
2 Lindsay & Hyde winders.
2 Grosser Jacquard machines for gloves.
4 Cyclone dryers
2 Typewriters.
5 Band folding and cutting machines.
5 30-inch ventilating fans.
1 Small Water Motor.
1 Small Steam Pump.
1 Small Belt Pump.
15 Rudolph Seaming Machines.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

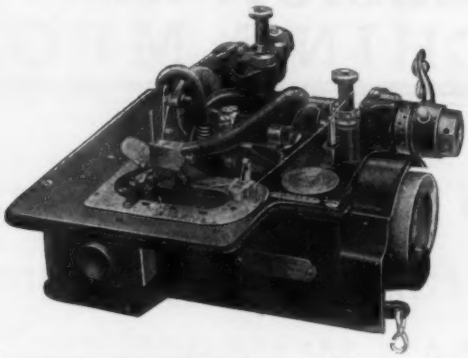
LITTLE FALLS, N. Y.

AN INSTRUMENT OF PRECISION!

"OVERLOCK" MACHINE

(Trade Mark) (Pat. April 5, 1892)

Patent twice upheld by U. S. Court of Appeals



Trade Mark

WILLCOX & GIBBS SEWING MACH. CO. NEW YORK

Business Established in 1859.

For TRIMMING, SEAMING (or Hemming or Overedging) and COVERING Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION** at 3000 Stitches per Minute.

WILLCOX & GIBBS SEWING MACHINE CO.,

General Offices: 658 BROADWAY, cor. BOND STREET,

NEW YORK, N. Y.

LONDON PARIS MILAN DRESDEN

THE GROSSER KNITTING MACHINE CO.

WOOL EXCHANGE Room 400

MAX NYDEGGER

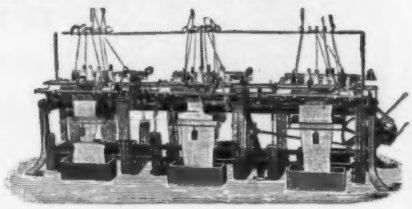
260 W. Broadway NEW YORK

SPECIAL MACHINES FOR ANY ARTICLE THAT IS KNIT

GROSSER Flat Knitting Machines

For HAND power or **Fully Automatic Power Machines.** Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand.

Power machines to be seen in operation.



COTTON PATENT HOSIERY MACHINES

Built by **H. ALBAN LUDWIG, Chemnitz,** for automatic production of **Full Fashioned Hosiery, Fine Half Hose, Ladies' Lace Hose, Fine Underwear;** high speed, large production. All gauges and any number of sections, from 2 to 24.

FRENCH FRAMES

C. TERROT SÖHNE, Cannstatt, Würt, famous builders of the best Circular Frame for **Finest Underwear, Fleece Linings, Gloves, etc.**

RASHEL MACHINES

For Fancy Goods in largest variety, **Shawls, Capes, Caps, Borders, Fringes, Lace Work,** etc., in silk, wool, cotton.

SPOOLERS, Paraffiners, Finishing Machines, for the knitting business.

SPECIAL OVERSEAMERS, "Julius Köhler,"

Indispensable for Full Fashioned Articles, Sweaters, Hosiery, Gloves, Sporting Goods.

Largest Stock in NEEDLES

For Knitting Machines. Best IMPORTED quality. All parts, accessories, etc., delivered immediately from stock.

Samples, Special Offers, Prices, etc., upon application.

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

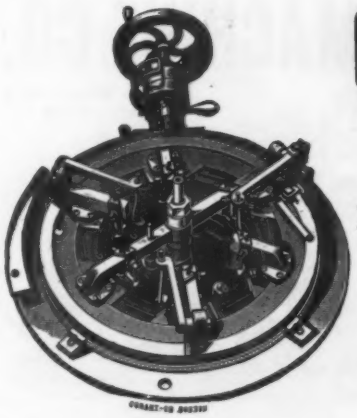
Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

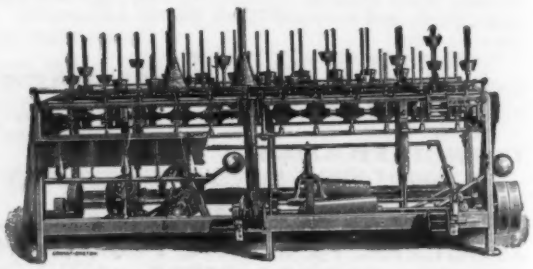


CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

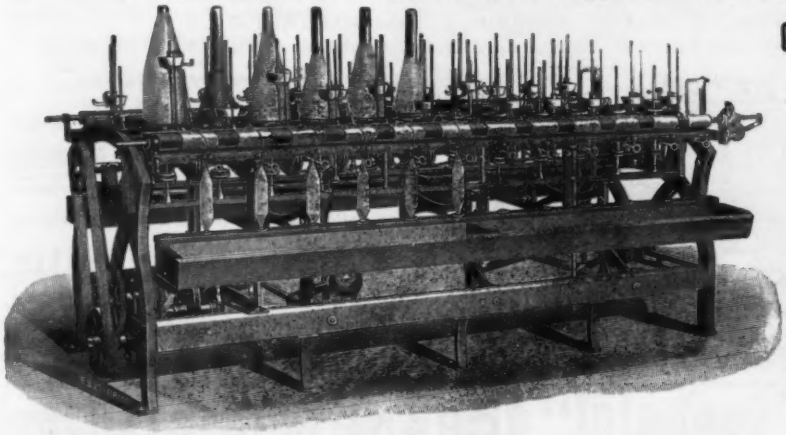
ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865, Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET
Pawtucket, R. I.

WILLIAM C. BULL, BENNINGTON, VERMONT.

For Ladies', Gents', and Children's Goods.
LATEST STYLES.
BEST WORKMANSHIP.

MAKER OF

Drying Form Boards

OF EVERY VARIETY.

WORKS: CHEMNITZ, SAXONY Established 1851

G. HILSCHER

FULL-FASHIONED HOSIERY AND UNDERWEAR MACHINE BUILDER

SOLE AGENT FOR UNITED STATES AND CANADA

EDWARD W. KOCH, 319 Bourse Building, Philadelphia, Pa.

"Awarded Gold Medal at World's Fair, Paris, 1900, for highest improvement in the mechanism of manufacturing full-fashioned hosiery, solidity and perfect workmanship in construction and the superiority of fabric produced."

SPECIALTIES:

COTTON-HILSCHER HIGH SPEED SYSTEM, 65 courses per minute.

COTTON SYSTEM, for horizontal stripes up to 6 Colors, Scotch plaids and vertical stripes, lace through the narrowing, split, etc., etc.

COTTON SYSTEM, wedge heel; this machine manufactures entire full-fashioned ladies' hose or half hose and dispenses with the foot machine.

COTTON SYSTEM, newest construction. The new machine knits the entire hose or half hose complete down to the toe, it makes French heels and French feet.

RIB MACHINES: Cotton system, with and without narrowing.

RIB MACHINES: Hilscher system, high construction.

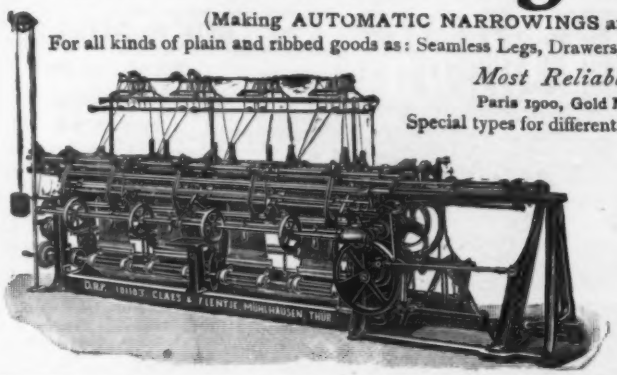
Machines can be seen in operation at above address.

FULL AUTOMATIC

Fashioning-Machine

(Making AUTOMATIC NARROWINGS and WIDENINGS)

For all kinds of plain and ribbed goods as: Seamless Legs, Drawers, Combinations, Sleeves, Suits. Blouses, etc.



Most Reliable and Productive Machine!

Paris 1900, Gold Medal! Paris 1900, Gold Medal!

Special types for different articles. Number of heads to order.

Automatic Sweater Machine

With Independent Heads, Latest Improvements. Recognized as "The Best."

Ask for samples and particulars, state guage and size you need.

Claes & Flentje,

MÜHLHAUSEN, THÜR, GERMANY.

Representatives: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N. Y., where all kinds of hand and power machines can be seen working.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY

} EFFICIENT DURABLE LOW IN PRICE

CRANE MFG. CO. Lakeport, N. H.

Spring Needle Circular

KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

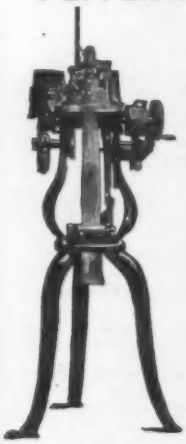
CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

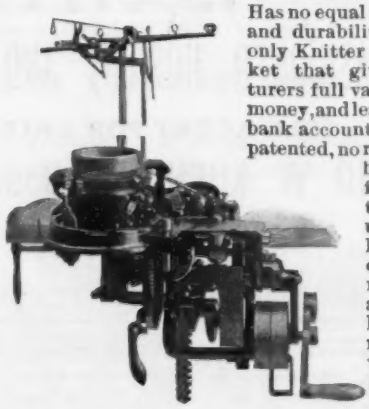
CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

The New Improved

Boss 15/16 Automatic

KNITTER



Has no equal for simplicity and durability. It is the only Knitter on the market that gives manufacturers full value for their money, and leaves a swelled bank account. It is fully patented, no royalty to pay; built in sizes from 2½" up to 6"; from 42 up to 220 needles in 3¾" machine. Knits men's, ladies' and children's hose, plain or ribbed. Runs with one single belt. Automatic tension in heel and toe. Send for prices and particulars to

THE BOSS KNITTING MACHINE WORKS,

Cor. Elm and Reed Sts., Reading, Pa.

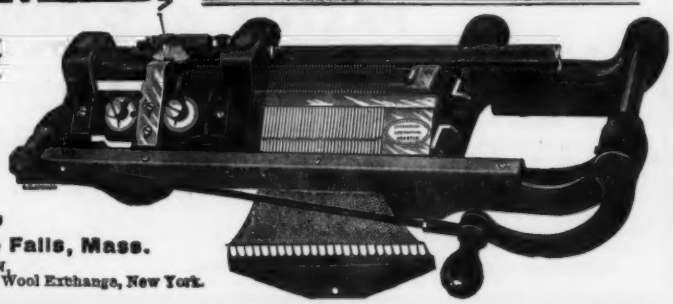
HARDENED STEEL CYLINDERS A SPECIALTY.

The LAMB, LEADER OF KNITTERS.

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 109 22d St., Chicago.

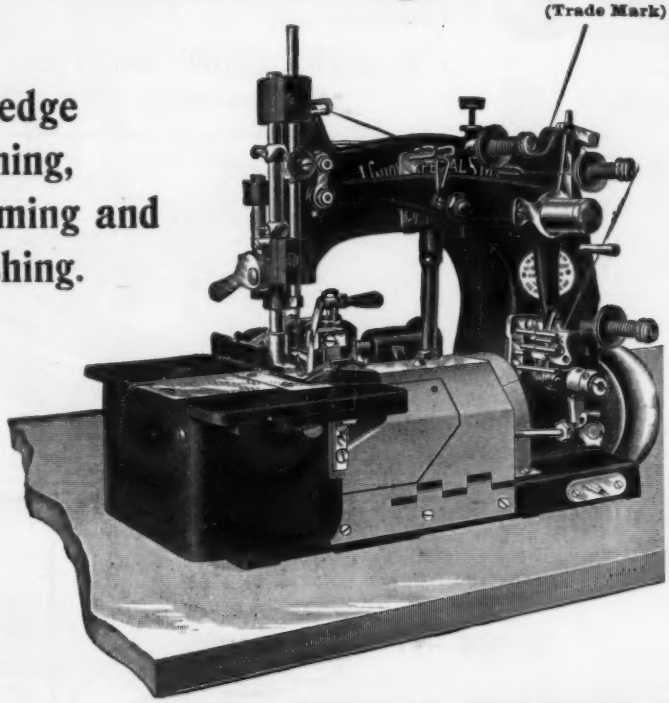
L. D. SANBORN, Room 805 Wool Exchange, New York.

High Speed and Most Durable Mechanism are the Essential Elements of Machines to Produce Sewed Articles. We have these Elements in the

New Union Special Single "Interlock" Machine

(Trade Mark)

For Overedge Seaming, Hemming and Finishing.



High Speed Class 15400.

Two or Three Thread Stitch.

Simplicity.

Durability.

UNION SPECIAL MACHINE CO.

75 E. Kinzie Street, Chicago.
731 Arch Street, Philadelphia.
9 Andrews Street, Rochester, N. Y.
96 South Street, Boston.
1230 Olive Street, St. Louis.
47 Leonard Street, New York.
Amsterdam, N. Y.
Cohoes, N. Y.
714 Main Street, Cincinnati.
578 Mission Street, San Francisco.
2 Gain Street, Montreal, Canada.

PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

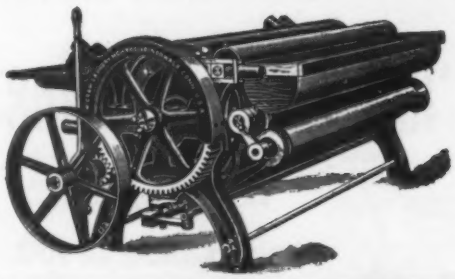
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,
SOUTH NORWALK, CONN.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,
N. W. Cor. Lehigh Ave. and Mascher Street,
PHILADELPHIA.

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

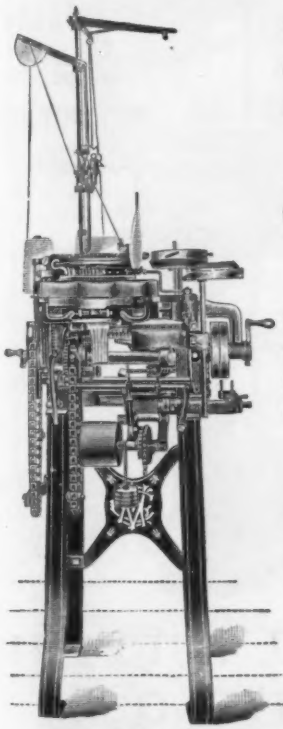
JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

Hosiery Boards.

We Know How

TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



in use than any other make.

Have you seen the new Standard F?

It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

ARE YOU INTERESTED?

STANDARD MACHINE CO.,
508 Ludlow Street,
Philadelphia.

The Hooven, Owens & Rentschler Co.

HAMILTON, OHIO.

BUILDERS OF THE

Hamilton-Corliss Engine.

Simple, Compound and Condensing, of any size, for all purposes.

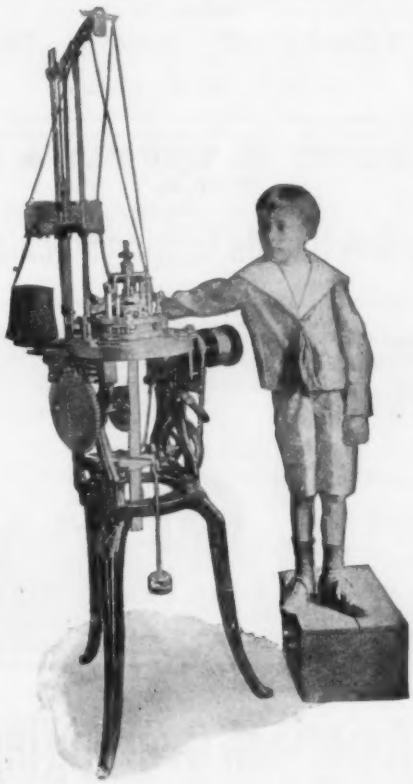
New York Office, 39 and 41 Cortlandt St.
Chicago Office, 46 South Canal St.
St. Louis Office, 317 Security Building.

A FAIR PROPOSITION

If wanting to purchase Ribbers, you can try a

RUTH RIBBER and STOP MOTION

before buying to satisfy yourself that they are all right. Our STOP MOTION is a decided improvement over all others. No cutting of yarn, easy to thread. Stops from any imperfection in yarn. The movement of one lever releases brake and corrects yarn guide, when stop is caused by knot you have but one hook to thread. Very positive in its action.



Our RIBBER is high speed, durable, simple and easy to operate, with largest production; single or double feed, plain or fancy stitch for half hose and misses goods. Large loose-course, good round welt, double knee, sleeves or cuffs. Knits wool or cotton yarn, fine or course guage. Hardened cylinders and dials for any make of machine. Best Workmanship. All products guaranteed. Can attach STOP MOTION to any style machine.

Write to-day for price lists.

RUTH MACHINE CO., York, Pa.

Address Box "N." G. W. Ruth, Manager.

Do you wish to make knit goods as perfect as the French or German, and as rapidly as the American?

Do you want to plait?

Do you want to knit worsted or silk?

?

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TOMPKINS BROS. CO.,

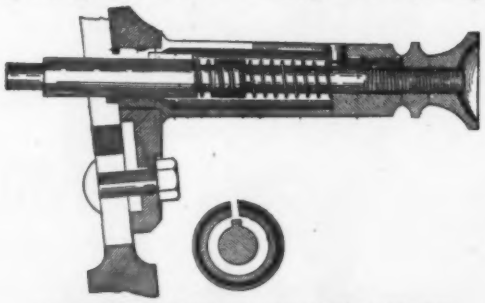
TROY, N. Y., U. S. A.

ROBERT W. CORMLY & CO.

TROY, N. Y.

BUILDERS OF

Spring Needle Knitting Machinery

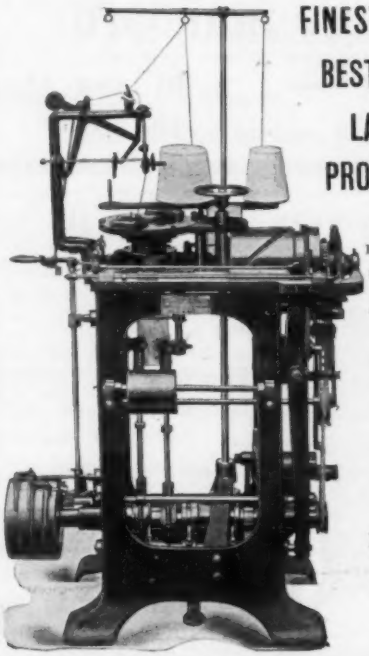


PATENT BURR STAND TUBE

The cheapest and best on the market with more and simpler adjustment than any other make.

"NATIONAL"

Stands for



FINEST GAUGES

BEST FABRIC

LARGEST PRODUCT ON

Greatest Variety of Laces, and Novelties.

All automatic.

Lowest Cost for Operating

Also

Rib Knitting Machinery, Overedge, Crochet and Shell Stitch.

NATIONAL AUTOMATIC KNITTER CO.

728 Cherry Street, PHILADELPHIA, PA.

Julius Kayser, Pres. Simon Banner, Treas.

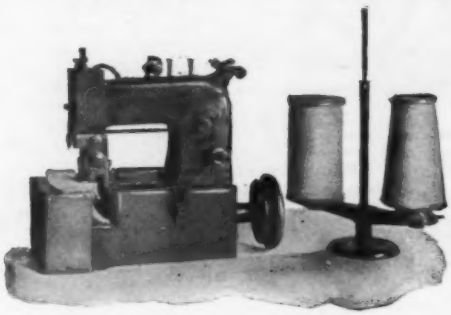
American Overedging and Seaming Machine Co.

Manufacturers of

Overedging

AND

Seaming Machines



For All Kinds of

Cut and Full Fashioned Underwear and Sweaters

FACTORY, 543 EAST 116th STREET - - - - - - - NEW YORK CITY

A WHEEL WITHIN A WHEEL IS AN EASTMAN ELECTRIC CLOTH CUTTING MACHINE

IN THE

UP-TO-DATE FACTORY

THE EASTMAN MACHINE COMPANY

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OFFICES:
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Chicago, 245 Jackson Boulevard.
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HOSIERY, SHIRTS AND ALL PURPOSES WHERE A WHITE, TINTED OR BLACK BAND IS USED.

If you want fine quality at the same cost specify our paper to your printer.

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The CRAWFORD

HOLLOW STEAM

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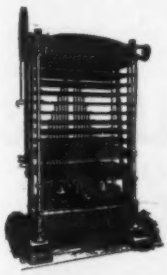


For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,

Successors to
J. J. CRAWFORD & SON,

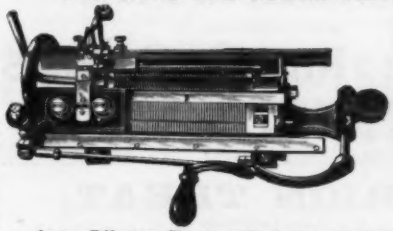
NASHUA, N. H.

Established 1868.

Best Knitting Machines

IMPROVED CONSTRUCTION

FOR HAND AND POWER DRIVING.



High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. 80,000 Machines sold.

CLAES & FLENTJE,

Mühlhausen, Thür, Germany.

Agents for the East: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N. Y.
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DAVENPORT PEARL BUTTON CO.

Davenport, Iowa.

Manufacturers of

PEARL BUTTONS.

New York Office, - - - - - 377 Broadway

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Fine Specialties for Fancy Knitting Trade.

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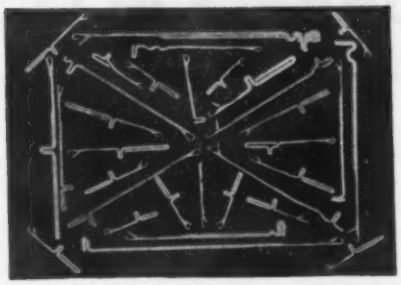
They will save you money.



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The best Hosiery Needles in the market.
Manufactured by
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Work Guaranteed. MANCHESTER GREEN, CONN.

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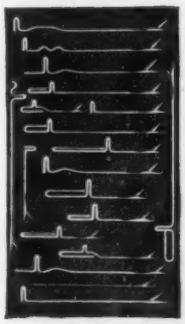

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Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder, **Spring Needle Cylinder Rib-Top Machines** for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

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MECHANICAL HEATING, VENTILATING AND DRYING, MECHANICAL DRAFT FANS

ELECTRIC Propeller Fan.

12 inches to 12 feet.

Alternating and Direct Current.

Get Cata. 50A.

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OF EVERY DESCRIPTION. ALSO LAUNDRY SOAPS.
ALL GOODS GUARANTEED.

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Cleans Wool, Floors, Anything.

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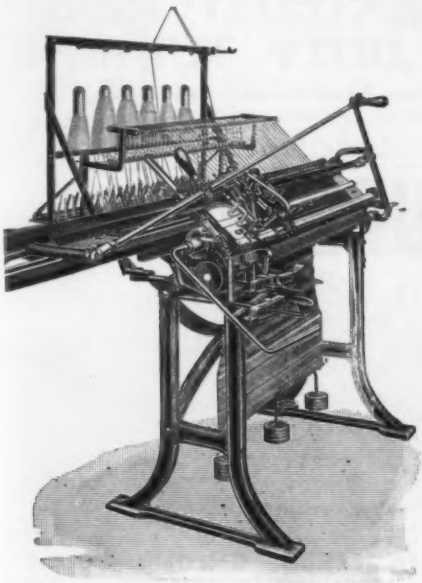

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for hand and power driving, of best quality and perfect construction.

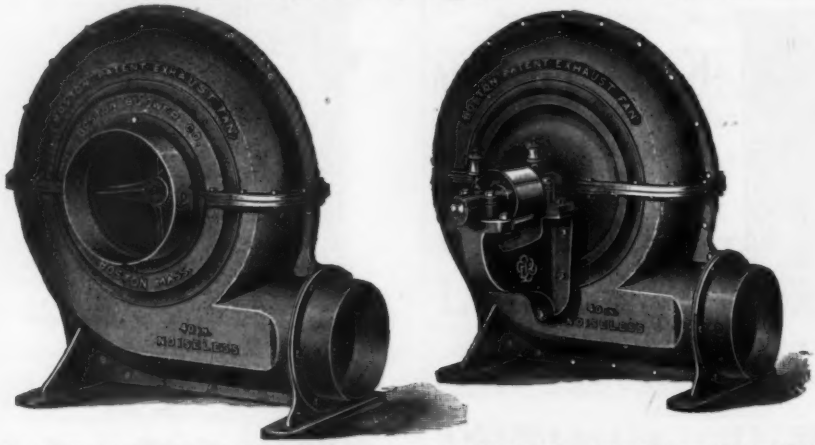
SPECIALTY: JACQUARD MACHINES

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

PRICE LISTS AND SAMPLE ON APPLICATION.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

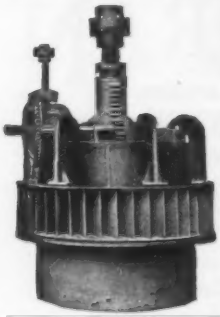


Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



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On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

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An EVEN and REGULAR SPEED under all CHANGES of LOAD makes the SAMSON especially desirable for driving all classes of machinery where the output must be UNIFORM in TEXTURE and QUALITY.

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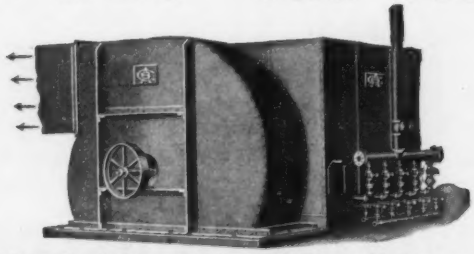
THE "A B C" FAN SYSTEM



The Ideal Method of Heating and Ventilating Textile Mills.

Thos. F. Parker, President The Monaghan Mills, Greenville, S. C., writes:

"We heat our mill, which is a four story building 450 ft. long by 130 ft. in width, with your hot air heating system. The equipment furnished by you has proved satisfactory in material and workmanship. We have had no trouble with your plant and consider it well adapted for heating of mills and other large buildings."

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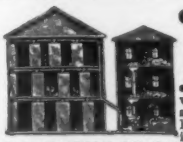

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THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

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For TEXTILE MILLS

We Guarantee Satisfaction.

Replogle Governor Works

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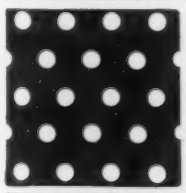

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Perforated Screens of all kinds.

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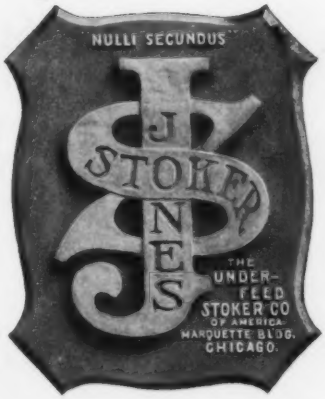

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4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

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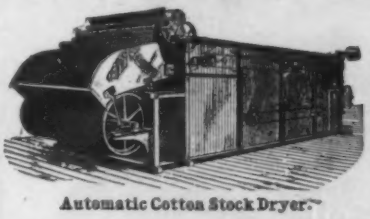

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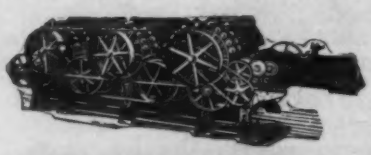
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



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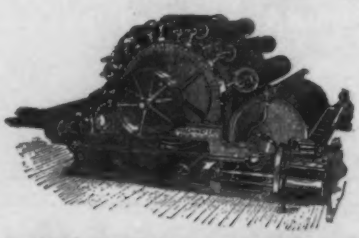
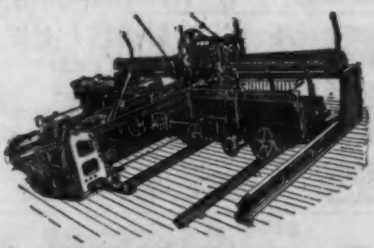
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





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Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

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CHAPTER ONE

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Butterick Patterns have been standard for forty years. They were the first paper patterns ever made, they have been developed on scientific principles that assure results to the woman who uses them, and despite imitation the name "Butterick" is still the final word in paper patterns.

ASK YOUR WIFE!

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THE DESIGNER
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OPEN WIND from start to finish of cone.
No press-offs from knots, no flattening of yarn.
The only perfect system of winding yarn.
for knitting purposes.

TUBE WINDERS, SKEIN WINDERS, DOUBLERS.

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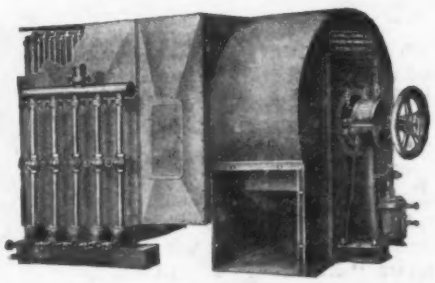

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Of Heating — Ventilating — Drying
and Humidity Control
Used by America's Foremost Textile Mills.

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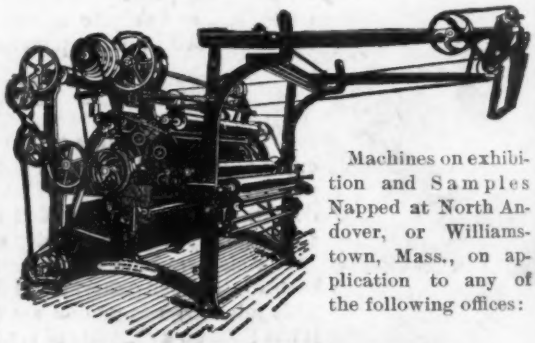

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